

NAVAL HEALTH RESEARCH CENTER

*1990 Command History
for
Naval Health Research Center
San Diego, California*

March 1992

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NAVAL HEALTH RESEARCH CENTER
P O BOX 85122
SAN DIEGO, CA 92186-5122

BUREAU OF MEDICINE AND SURGERY (MED-02)
2300 E ST. NW
WASHINGTON, DC 20372-5300



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**1990 Command History
for
Naval Health Research Center, San Diego, California**

1. BASIC HISTORICAL NARRATIVE

a. Mission: To support fleet operational readiness through research, development, test, and evaluation on the biomedical and psychological aspects of Navy and Marine Corps personnel health and performance, and to perform such other functions or tasks as may be directed by higher authority.

b. Description of Organization: For 1990, the command had two reorganizations as shown below. The Office of the Commanding Officer consists of the Commanding Officer and Executive Officer.

AS OF 1 FEB 90:

Commanding Officer (00): Robert D. Chaney, CAPT MC USN
Executive Officer (01): Larry M. Dean, CAPT MSC USN

Other Senior Staff Members

Administrative Officer (02): Glenn R. Baker, LCDR MSC USN

Scientific Director (Code 001): Vacant

Consultant for Scientific

Affairs (Part time) - E. K. Eric Gunderson, Ph.D.

*Program Managers for

*Sustained Performance Programs (Code 002)- Robert S. Pozos, Ph.D.

Department Heads:

Operational Performance (Code 10) - James C. Hodgdon, Ph.D.

Sustained Operations (Code 30) - Guy R. Banta, CDR MSC USN

Sleep Optimization Research (Code 50)- Paul Naitoh, Ph.D.

Cognitive Psychophysiology (Code 70) - David Kobus, LT MSC USN

*Health Analysis Programs (Code 003) - D. Stephen Nice, Ph.D.

Department Heads:

Medical Decision Support (Code 20)- William M. Pugh

Health Services Research (Code 40)- Anne Hoiberg

Epidemiology (Code 60) - Frank C. Garland, Ph.D.

EFFECTIVE 1 NOV 90, AND AS OF 31 DEC 90

Commanding Officer (00) : Guy R. Banta, CDR MSC USN
Acting Executive Officer (01): Glenn R. Baker, LCDR MSC USN

Other Senior Staff Members

Director of Research Support

(Admin Ofcer) (02) : Glenn R. Baker, LCDR MSC USN

1990 Command History-NHRC

Scientific Director (Code 001)	- John Silva, Ph.D.
Deputy Directors:	
Human Performance (Code 002)	- Robert S. Pozos, Ph.D.
Department Heads:	
Operational Performance (Code 10)	- James C. Hodgdon, Ph.D.
Sustained Operations (Code 30)	- Harold Goforth, Ph.D.
Behavioral Psychobiology (Code 50)	- Tamsin L. Kelly, M.D.
Cognitive Psychophysiology (Code 70)	- David Kobus, LT MSC USN
Stress Medicine (Code 90)	- Ross R. Vickers Jr., Ph.D.
Health Sciences (Code 003)	- D. Stephen Nice, Ph.D.
Department Heads:	
Medical Decision Support (Code 20)	- William M. Pugh
Health Services Research (Code 40)	- Anne Hoiberg
Epidemiology (Code 60)	- Frank C. Garland, Ph.D.

Immediate Superior in Command:

(1) Commanding Officer, Naval Medical Research and Development Command,
Bethesda, Maryland

c. Description of Mission Accomplishments. Current mission elements of:

(1) The mission accomplishments of the **Operational Performance Department** focused in four areas: Measurement and prediction of cold weather induced combat performance decrements of U.S. Marine Corps personnel; development of a program for treatment of training related musculoskeletal injuries in Navy recruits; determination of the effect of skin blood flow on bioelectrical impedance; and identification of risk factors for infectious disease.

Data Exchange Agreement (DEA) between NMRDC laboratories and the Norwegian Army is signed and the first study under the DEA is carried out. Two follow-up studies of Marine Corps performance in the field in cold and at altitude are completed. A new test battery of four simulated combat tasks and two physical capacity measures is developed and implemented. Risk factors for infectious disease are assessed. The International Cold Symposium, hosted by this Center's Department, was held 13-15 February 1990 at Minden, Nevada.

The Medical Rehabilitation Program continues to treat and monitor training related musculoskeletal injuries at the Recruit Training Command, Naval Training Center, San Diego. A system for tracking injuries is developed and implemented. Two studies are conducted to determine a model for prediction of musculoskeletal injury from a variety of anthropometric, morphological, and functional measures. One study is cross-sectional in design and uses Marine Corps recruits as subjects, while the other study is longitudinal, involves Navy recruits, and is a joint effort with Stress Medicine Department, Code 90.

Studies initiated are: 1) to evaluate a modified BUD/S boot is conducted under contract at Children's Hospital, San Diego; 2) a Naval Coastal Systems Center reimbursable project examining the energy expenditure and heat production

of divers wearing dry suits and swimming in cold water and, 3) a MicroSAINT model is developed to predict effects of load carriage from existing U.S. Army equations.

Two studies completed include 1) an Independent Research project (6.1) investigating the effect of changes in skin blood flow on bioelectrical impedance and 2) to determine the validity of three different methods of measuring residual lung volume.

At the beginning of DESERT SHIELD, LT Hesslink initiated a research project on microclimate cooling which was later transferred to the Sustained Operations Department under the direction of Dr. Tony Sucec. For complete department review, see page B-1.

(2) The Medical Decision Support Department develops rapid retrieval and statistical forecast methods to project morbidity in Navy and Marine Corps populations. Methods for providing medical personnel with timely medical diagnosis or treatment information are developed, and methods for maintaining the continuity of patient care as well as the management of illnesses and injuries are studied and evaluated. These medical decision support capabilities provide medical planners the information needed to manage and allocate medical resources effectively.

Two new work units were initiated. One, the "Development of Methods for Improving Medical Data Collection at Forward Echelon of Care," a follow-on effort to compute casualty rates for the Navy and Marine Corps; and two, "Development of Medical Management Tools," an effort to update the Navy's epidemiologic capabilities.

Disease and Non-battle Injury (DNBI) data were analyzed for Navy and Marine Corps personnel. For each service, separate rates were developed for geographic region and the type of force. In addition, the effect of combat intensity was computed. These results were used to develop a matrix designed to show a medical planner the dynamic relationships among inpatient rates, outpatient rates, and the level of combat intensity.

Through participation with the Wartime Healthcare Documentation work group, a revised Field Medical Card was developed. Field testing of the revised card showed that additional revisions were needed. The working group used the data from NHRC to develop the final version of the new Field Medical Card.

A data base of Battle Injury information was developed which contains summary information on all casualties aboard Navy vessels during World War II, and detailed information on battle injuries aboard 523 major combatants and 474 non-major combatants. Also, included is information on Navy and Marine Forces ashore during World War II and Marine Corps Casualty data from Vietnam. Analyses were conducted to determine the casualty rates for the patient conditions used by the medical supply system. In addition, casualty rates were computed for particular ships and ship types, as well as all major ground operations during World War I.

A Computer Assisted Medical Diagnosis system was developed and demonstrated. This system is a "shell" which accepts various types of knowledge bases and uses the knowledge provided to prompt the user for the patient's signs and symptoms information to be used to project a probable diagnosis. The system will accept, without programmer intervention, knowledge in the form of rule based, bayesian, neural network, or regression algorithms. See Page C-1 for Department review.

DESERT SHIELD/STORM. This Center and the Naval Medical Doctrine Center collaborated in the design of a Medical Encounter Data Sheet to capture Disease and Non-Battle Injury (DNBI) and Battle Casualty (BC) information from U.S. Navy and Marine Corps forces participating in Operation Desert Shield. Results from the DNBI and BI analysis were provided to medical planners at the Medical Doctrine Center, OP-932, OP-601 and at the 1st Force Service Support Group during planning for Desert Shield. The data collection systems developed to gather DNBI and BI data were implemented during the Desert Shield/Storm operations to collect data for future evaluation and analysis. When deployed, the computer assisted diagnosis package will provide support to Independent Duty Corpsmen. See Page C-1 for Department review.

(3) The research programs in **Health Services Research Department** are focused on health promotion, health and physical readiness, HIV seropositivity and ethnic/minority status, family violence, case management of Navy occupational injuries, health care requirements for women aboard ships, and career intentions of Navy Dental Corps officers. Each of these programs is designed to provide direct decision support to Navy medical and operational planners in areas identified by higher authority.

Subprojects of the Health and Physical Readiness Program Evaluation work unit were conducted and results reported in technical reports in the following areas: (a) determining the prevalence of hypertension among active-duty Navy personnel, (b) evaluating the Navy's health promotion videotapes, (c) assessing pre- and post-fitness measures into two remedial condition programs, (d) assessing nutrition knowledge among U.S. Navy personnel, (e) evaluating the impact of health and fitness-related behavior on quality of life, (f) determine the types and prevalence of tobacco use programs at Navy commands, and (g) examining the relationships among smoking exercise, and physical fitness. Three prior technical reports were published in journals regarding health risk appraisal feedback; on health related correlates of perceived life quality, and assessing replicable dimensions of health behaviors. Other major research efforts initiated include: the development and evaluation of a tracking system for health promotion data, a study of the feasibility of using a walk test in the Physical Readiness Test, and an evaluation of the Navy's healthy back program.

The Operational Navy Medical Support program addresses two issues. First, work on health care requirements for women aboard ships was completed. Final results and recommendations were presented to VADM Zimble, RADM Buckendorf, RADM Stertz, RADM Loar, Force Medical Officers, and the Naval Military Personnel Command's Women at Sea Task Force. Second, a survey of the Navy Dental Corps was conducted to assess factors associated with career intentions and organizational climate. Results of this study were presented to RADM Clegg, and to the Commanding Officer's Conference during the 97th Annual Meeting Association of Military Surgeons of the U.S.

Results of the first completed report on a research endeavor "HIV Seropositivity and Ethnic/Minority Status in the U.S. Navy" identified populations that should be targeted to receive HIV intervention and prevention education in efforts to reduce the incidence rate of HIV seropositivity. These findings and other information on demographic and career characteristics on HIV seropositives were presented at the "Workshop on the Epidemiology of Retrovirus Infections" in Bethesda, Maryland. Other prepared reports have examined active duty status and reasons for separation as well as clusters of diseases that occurred prior to HIV testing among HIV seropositives.

The "U.S. Navy Occupational Illness and Injury Medical Case Management Study" was completed during 1990. This research endeavor describes the Navy Occupational Injury and Illness Case Management Process (NAVCAMPRO) which was designed to coordinate the medical care of occupationally injured and ill Navy civilian employees, to manage all facets of these cases, and to reduce the high costs of medical care and compensation. Recommendations resulting from this study included the implementation of NAVCAMPRO as well as return-to-work plans, light-duty job opportunities, training programs, a Create-a-Returned Employee (CARE) program, and an evaluation study of the effectiveness of NAVCAMPRO. Implementation of this case management process was expected to have any impact on cost containment efforts by saving the Department of the Navy compensation and medical care costs. See page D-1 for department review.

(4) The Behavioral Psychobiology Department's area of investigations include, but are not limited to, pharmacological agents as specific interventions for mission relevant factors, such as sleep deprivation; operational impact of pharmacological agents given for medical reasons; the psychophysiological effects of atypical work environments; ways of optimizing work/rest cycles within operational situations; and the effects of disorders of arousal and sleep on personnel effectiveness.

In his role as Chief Scientist for Sleep Research, Dr. Paul Naitoh has instituted the technique of complex demodulation time series analysis in the laboratory. This intricate statistical technique is extremely valuable for separating out the effects of circadian and other rhythms from the effects of experimental factors being evaluated. Such techniques are of particular utility in the prolonged repeated measure type of study that this department specializes in.

The visual evoked potentials for CNV analysis are now included in the Effects of Psychopharmacological Agents on Performance project. The salivary assays on the first half of the subjects is completed. Data collection continues and is expected to be completed this year. Preliminary results suggest that caffeine is having beneficial effects on both speed and accuracy of performance. The salivary assays are providing an excellent picture of both drug levels and of the circadian rhythm of cortisol.

To keep the pilot study on the effects of cold water diving on beta-endorphins at a minimum cost, it was piggy-backed onto a 6.2 Special Warfare research study which was eventually phased out. Arrangements have been made to perform the necessary data collection during another 6.2 level Special Warfare research study. The first data collection is scheduled to begin in April.

The complete analysis on the methylphenidate/pemoline study indicates that pemoline may prove to be a valuable stimulant drug for use under certain operational conditions. A follow-up study is to commence shortly.

The first phase of Study 7, The Use of Stimulants during Sustained Operations of the Biomedical Enhancement of Mission Performance of Special Warfare Personnel research project, has been completed. IBM PCs have been obtained and software developed to run the next phase on the new machines. The medications for the second phase are prepared and randomized, and the study will start as soon as a subject source is determined (BUDS students will not be used for this phase).

The 20-minute Nap Study, Subproject 2, Ultra-short Sleep Logistics of the Naval Forces Cognitive and Physical Performance Enhancement during Sustained Operations work unit, was completed. Findings include improved accuracy but somewhat slower performance in napped subjects, especially during the second circadian trough of the continuous work period. Sleep efficiency during the nap periods averaged 71%. There was evidence in the 20-minute nap subjects, and particularly in some pilot 5-minute nap subjects, of psychological stress resulting from the naps, possibly related to prolonged sleep inertia. Therefore the possible need for training in the use of naps is raised.

Sleep, sleepiness and performance data have been collected on seven patients under the Army reimbursable work unit, A Cross-sectional and Longitudinal Polygraphic Sleep Study of HIV seropositive Patients. Increased daytime sleepiness and abnormal nighttime sleep have been documented in these subjects. The system for computer recording and spectral analysis of nighttime sleep has been developed.

DESERT SHIELD/STORM. A report based on sleep log data collected in the Gulf was completed. Collection of more extensive sleep logs is planned to facilitate correct application of sleep logistics principals to the Desert Shield type of environment. See page E-1 for department review.

(5) The Epidemiology Department has two major mission research areas, the Occupational Studies Program and the HIV Central Registry. Several new sources of information have been added to the HIV central Registry which widened the department's ability to conduct epidemiologic studies. Ship deployment information obtained from the Chief of Naval Operations has been integrated into the Career History File maintained at NHRC. Using this resource and career history information concerning duty station assignments, the department has conducted an epidemiologic study of risk of HIV infection according to foreign ports visited by active duty enlisted personnel. Detailed HIV Western blot test results were added to the HIV Central Registry, allowing future studies of long-term outcomes associated with a variety of testing results.

Occupational studies have been conducted in the Navy by combining Navy occupations having possible common exposures. For example, the rate of melanoma in primarily outdoor occupations was compared with that of personnel in primarily indoor occupations. Personnel in outdoor occupations had equal or lower risk of melanoma than those in indoor occupations. While this finding may seem contrary to expectation, it is consistent with other populations which have been studied for the occurrence of melanoma. This type of grouping of occupations can be used in future studies.

A data system for the collection of information regarding injuries occurring during basic training was also developed and added to department data resources. A data collection procedure was designed and brought on-line at two recruit training centers and information on the types of injuries sustained during recruit training was obtained and analyzed.

DESERT SHIELD/STORM. The Department provided HIV testing data to the Naval Manpower Personnel Command and the Naval Personnel Reserve Command. This information was crucial to deployment of troops, as it is Navy policy that no individuals can be assigned outside the Continental United States unless they have an HIV test on file which was given within the past six months. See page F-1 for department review

(6) Current mission elements for the **Cognitive Psychophysiology Department** concern mental workload, allocation of attentional resources, multimodal information processing, ambient illumination (low level white lighting), and man/machine interfacing. Studies are also conducted which monitor various changes in human cognition during sustained or continuous operations under various environment stressors (i.e., heat, cold, noise, etc.)

Collaborative research efforts were organized in the study of attention deficits in AIDS patients with several researchers from the University of California at San Diego, Scripps Clinic & Research Foundation, Biomagnetic Technologies Inc. Audiologists and acoustical consultants from Children's Hospital Speech, Hearing, and Neurosensory Center in San Diego designed the Shipboard Habitability laboratory and recommended audiometric and sound-delivery equipment needed for the project.

Trained Submarine support personnel were trained in the manufacturing and implementation of Low Level White Lighting (LLWL)--using several layers of "smokey gray" filters around light fixtures to reduce the luminosity levels for night time vision yet preserve the ability to see color. As of February, all U.S. SSN and SSBN submarines in the Atlantic and Pacific fleet were installed with LLW filters in operational areas.

Biopsychometrics -- using changes in brain activity to monitor real time changes in vigilance and performance. Computerized neural network model was being developed as a real time "template" of vigilance. This model would be used as a way to determine lapses in vigilance and performance which can be used to feedback an alarm to the operator to regain a state of alertness.

DESERT SHIELD/STORM. LT S. Linnville, MSC, USNR, spent eight days onboard the USS RANGER (CV-61) enroute to the Persian Gulf where he collected sleep and health data by questionnaire given to the troops being deployed. He also conducted a survey using low level white lighting in the Combat Operations Center. See page G-1 for department review.

(7) Established in May, the Stress Medicine Department work focused on the completion of a major series of studies in psychoimmunology and development of new lines of research on individual differences in stress reactivity and cognitive performance assessment in field settings, testing conditions to provide a wider range of measures of stress effects.

A research program was initiated on individual differences in stress reactivity to be conducted with Office of Naval Research funding.

In collaboration with the Pittsburgh Cancer Institute, University of Pittsburgh, School of Medicine, a research project examining the psychological correlates of natural killer cell activity (NKCA), an immunological parameter that is related to resistance to viral infections and cancer in Navy personnel, was completed. Data analysis and report describing the results of two studies of Navy recruits in personality, and coping were considered as predictors of NKCA. The studies confirmed (1) that people differ substantially to their typical or average level of NKCA; (2) the analyses indicated that individuals with low NKCA scores tended to be those with high scores on indicators of neuroticism and interpersonal warmth; (3) the stress of the initial exposure to training was associated with a lower than average NKCA value for the typical recruit, and that this deviation from average was greater for introverted individuals than for extroverted individuals; and (4) that low NKCA values predicted the severity of upper respiratory illness in recruits. The explicit identification of stable individual differences as the NKCA component that is related to neuroticism, the identification of interpersonal warmth as a correlate of low NKCA and the demonstration that introversion was related to the magnitude of stress effects on NKCA appear to be novel findings within the field of psychoimmunology. A study of Navy Company Commanders was conducted to replicate and extend the findings obtained in recruits.

In collaboration with the San Diego Veterans Administration Hospital/University of California Medical School/Lee Biomolecular Research Inc., of San Diego, a series of studies examining reactivation of latent infections as a potential indicator of overall effectiveness of the immune system in controlling viral infections, was completed. The studies demonstrated that the stress of basic training did not lead to reactivation of latent herpes virus infections. Reactivation was defined as a four-fold or greater rise in antibodies as measured by radioimmunoassay or neutralizing antibody assays. Mean levels of antibodies were unchanged over the course of basic training. Instead recruits entered basic training with varying levels of antibodies to herpes simplex viruses, Type 1 and Type 2, and these initial differences were highly stable over the two-month basic training program. The differences in typical antibody level may provide an index of general resistance to infections, because individuals with higher antibody levels reported more severe respiratory illnesses during training.

DESERT SHIELD/STORM. A questionnaire was developed measuring depression states to be given to the troops during deployment. See page H-1 for department review.

(8) The Sustained Operations Department major accomplishments include for the period January-June: The major new thrust was into thermal/environmental physiology.

During this period, data analysis of Persian Gulf field trips were completed. Results identified marked effect of operational conditions (high heat/sleep loss) on mental fatigue, mood, sleep problems, tension/anxiety, and thermal regulation. Implementation of a passive (ice) microclimate cooling vest was found to significantly alter these responses.

A field assessment of Marine Corps personnel during a 25-mile march wearing chemical defense ensemble and field pack was completed. Analysis of data revealed that although 4-5 lbs average weight loss occurred, a 25-mile march with load is tolerable as long as rest breaks occur every hour, forced hydration occurs, and ambient conditions (temperature) are minimal (approximately 70°F on this study).

A laboratory assessment of 5-, 10-, 20-, and 60-minute naps following 64 hours of sleep loss was conducted. Results revealed that performance of subjects who were allowed nine 20-minute naps (one every 6 hours) tended to be more accurate on some cognitive tasks than those who remained awake throughout the 64 hours. Naps taken for 5 or 10 minutes were found to be unacceptable. Studies assessing performance following 60-minute naps is currently ongoing.

For the period July-December: Changed research priorities to address critical issues related to desert warfare in a chemical environment (Desert Shield/Storm). Reassigned personnel, equipment, and supplies to form a special research cadre to study microclimate cooling: Dr. R. Pozos, LT R. Hesslink, Dr. A. Sucec, Mr. J. Heaney, Mr. D. Trone; Hydration/Hyperhydration: LCDR B. Bennett, Dr. Hagan; and Thermal Monitoring: Dr. R. Pozos, Mr. J. Heaney, & Ms. T. Sopchick.

1) A special research cadre was formed and initiated studies to determine efficacy of an infrared device to accurately measure tympanic membrane temperature as an approximation of core temperature. 2) Initiated research to test the efficacy of four fluid replacement solutions as hydration/hyperhydration interventions in a high heat environment (120°F). 3) Initiated a series of studies to select and test the efficacy and feasibility of an ice vest to provide microclimate cooling of Marine Corps personnel walking in a high heat environment. 4) Completed documentation of a study using a hyperhydration solution to delay dehydration experienced by Navy SPECWAR divers during prolonged cold water immersion. Results demonstrated, however, that hyperhydration with aqueous glycerol solution appears ineffective in reducing body water loss in divers under stress of prolonged cold water immersion. 5) Initiated a new substudy for Navy SPECWAR entitled, "Epidemiology of soft-tissue/Musculoskeletal injuries among U.S. Navy SPECWAR Personnel."

Collaborative research was initiated with the following individuals and institutions: Warren Lockette, M. D. and Steve Farrow, M.D., Wayne State

University, University of Michigan, and VA Hospital, Allen Park, Michigan; Ronald Bulbulian, Ph.D., University of Louisville, Kentucky (summer ASEE); Michael Buono, Ph.D., San Diego State University (summer ASEE); David Arnall, Ph.D., University of Northern Arizona, Flagstaff; Arthur Vailas, Ph.D., Biodynamics Laboratory, University of Wisconsin, Madison; Naval Science Advisory Program (NSAP).

DESERT SHIELD/STORM. Research priorities were changed to address issues related to desert warfare in a chemical environment, to study microclimate cooling suits, and hydration/hyperhydration. See page I-1 for department review.

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2. SPECIAL TOPICS

a. Statistics on major functions (volume of) logistic support, training, or recruiting:

Training: NHRC has 100% participating in training and encourages all staff members to take advantage of the numerous private one-, two-day training programs available year round. Training includes, but is not limited to Equal Employment Opportunity functions, sexual harassment, and opportunities for Total Quality Leadership (TQL). Many enroll in NARDAC's computer training programs. Safety training is scheduled on a monthly basis. Some lectures are given by outside sources such as San Diego Gas and Electric on electrical shock safety, Environmental Health Coalition, or California Highway Patrol. CPR certification and recertification is provided on a quarterly basis. Training and assistance available from the local Family Services Center is published in the command's plan of the week for military members. Civilian Personnel office sends announcements by EMail of training available to civilians.

Throughout the year the command provides training to numerous Ensigns, Medical Corps on a ADT/OJ clerkship in preventive medicine/sports medicine/epidemiology/research neurology.

Recruiting: LCDR Phillip Hunt, MC, USNR, after personal contact with Captain Chaney, returned to active duty reporting to this Center on 27 September 90 to work with SPECWAR and other physiologic studies.

Although the command does not have a recruiting program, on occasion contract students onboard from San Diego State University or University of California San Diego assisting in the various research programs will inquire about the Navy programs available to graduate students.

b. Military and Civilian Personnel onboard as of 31 December 90:

66 Civilians; 22 Military (10 Officers, 12 Enlistees)

c. Major command problems faced/significant changes during the year:

Significant changes during 1990:

(1) (Feb/Nov) At the request of Naval Medical Research and Development Command, the Center begun a reorganization in late 1989 which established two scientific programs managers to provide direction for the seven departments and became effective as of 1 February 90 (as shown on page 11A).

With the arrival of the Scientific Director in October another reorganization was initiated. The Stress Medicine Department was established for a total of eight departments, and became effective 1 November 1990.

(2) (Aug) With the start of Desert Shield two officers from the command were immediately deployed to Saudi Arabia. The current Commanding Officer, Captain Chaney, received PCS orders effective 12 August 90 to Camp Pendleton where his assignment was CO of the Medical Detachment H&S Co, 1st Force Service Support Group (FSSG). LCDR John T. Coyne, MSC, USN received TAD orders to Saudi Arabia where he was Commanding Officer of Foxtrot Surgical Support Company, 1st Medical Battalion, 1st FSSG, Camp Pendleton.

With the departure of the Commanding Officer, the command then experienced two Acting Commanding Officers. The Executive Officer, Captain Dean became Acting Commanding Officer for the period August to 21 September departing to Washington, DC on PCS orders. CDR Guy Banta relieved CAPT Dean as Acting Executive Officer, and on 22 September relieved CAPT Dean as Acting Commanding Officer. Commander Banta received orders on 5 November 1990 appointing him as interim Commanding Officer.

(3) (Aug) Desert Shield changed the direction for current research being conducted.

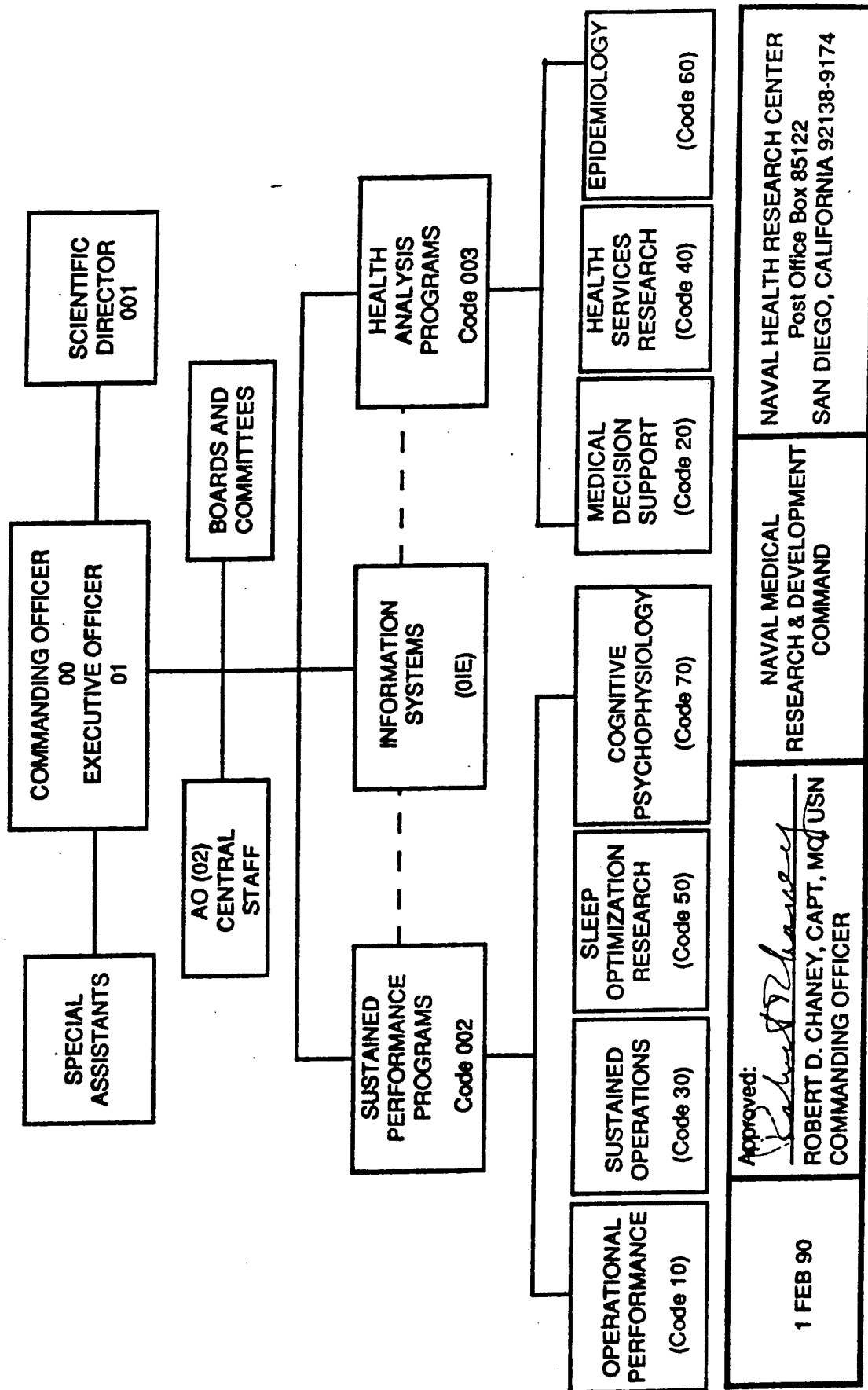
(4) (Oct) After the Chief Scientist retired on 30 September 1989, the command's Scientific Director position was vacant until 1 October 1990 when Dr. John Silva reported onboard as Scientific Director, transferring from Naval Ocean Systems Center, San Diego.

Noteworthy events during 1990:

(Feb) The command hosted the Cold Weather meeting on 13-15 February 90 at the Carson Valley Inn in Minden, Nevada. The meeting was open to interested researchers to explore opportunities for cooperative research dealing with the effects of cold weather on combat performance. Besides researchers from other U.S. military laboratories, invites to participate were extended to members from The Netherlands, Canada, Norway and the United Kingdom. A visit to the research test site at the U.S. Marine Corps Mountain Warfare Training Center was included.

(Feb) The Liaison Officer for Canadian Defence R&D, D. E. Holness, visited the command 12-13 February. The purpose of his visit was for introductory briefings and discussions on the research activities at this Center. His interest areas include occupational health; sustained operations and measures/methods to enhance performance under those conditions; physical fitness and performance; sleep deprivation and performance; stress immunology; and chemical defense.

NAVAL HEALTH RESEARCH CENTER



1 FEB 90	Approved: <i>Robert D. Chaney</i> ROBERT D. CHANEY, CAPT, MCJ USN COMMANDING OFFICER	NAVAL MEDICAL RESEARCH & DEVELOPMENT COMMAND	NAVAL HEALTH RESEARCH CENTER Post Office Box 85122 SAN DIEGO, CALIFORNIA 92138-9174
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Noteworthy events during 1990 cont:

(Mar) The Deputy Commander for Fleet Readiness and Support, RADM W. A. Buckendorf, MC, USN, visited the command on 19-20 March. Department briefs were given; a LCAC demonstration and brief were given at Camp Pendleton. Visits were made to the SPECWAR Center to see the SDV trainer and to Recruit Centers at Marine Corps Recruit Depot and Naval Training Center to review recruit rehabilitation programs.

(Apr) The Epidemiology Department coordinated the San Diego Epidemiology Research Exchange on 27 April, the primary forum for interaction among the San Diego community of epidemiologists. This program was cosponsored by the School of Medicine, University of California at San Diego; the Graduate School of Public Health, San Diego State University; and the San Diego County Department of Health Services.

(Apr) Frank A. Thompson, an employee who began his tenure at this command in January 1961 as a Psychology Technician, having retired in late 1989, passed away on 30 April.

(May) Beginning the month of May, the Center sent a group of researchers to Mt. McKinley, Alaska to collect data for its cold weather project. The team was headed by LCDR J. T. Coyne, MSC, USN; team members: Dr. Gregg McAninch (Mountain Warfare Training Center, Pickle Meadows, Bridgeport, CA); Dr. Robert Brownsburger (Marine Corps Air Station, El Toro, CA); Barbara Bales (Naval Hospital, San Diego); Art Kramer, (Research Psychologist, University of Illinois); and Eddie Shaw, Naval Health Research Center. The team worked closely with Robert Sieber, Mountain Ranger, Talkeetna Ranger Station, National Park Service, Talkeetna, Alaska, in recruiting subjects (climbers) for this project.

Results: Five weeks of data collecting at 14300 feet up the mountain (20300 ft). 100 subjects were recruited and performed physiologic and psychological test batteries at sea level (before and after climb) and at 14300 feet. Results show significant weight loss of FAT and LEAN body mass even with 5000 calories per day intake. Subjects also showed deficits in learning and retention on perceptual and memory task, and they also performed more slowly on most tasks suggesting long term deficits.

(May-Aug 90) This command continues to promote the American Society for Engineering Education (ASEE) summer research program. The ASEE program provides the college and university faculty members the opportunity to establish continuing research relations and to expand their professional contacts with the R&D community which experience is beneficial both personally and professionally.

(Jul/Nov) Anne Hoiberg, Course Manager conducted two classes, "Prevention of Sexual Harassment," at Naval Hospital, San Diego, in July for Federal employees and Navy enlisted personnel, and in November for federal supervisors and Navy Active Duty supervisors.

(Jul) Richard H. Rahe, M.D. on 26 July, presented the Annual 1990 Ardie Lubin Memorial Lecture on the subject of "Predisposing Life Events to Illness Susceptibility. Dr. Rahe, a former NHRC Commanding Officer, also conducted a workshop with NHRC investigators.

Noteworthy events during 1990 cont:

(Aug) The Center hosted the LCAC Medical Standards Conference on 27-28 August 90. The afternoon program included a LCAC tour and demonstration at ACU Five, Camp Pendleton. The medical working group met on the second day.

(Aug) On the 31st of August, Harvey Babkoff, Ph.D., Professor, Faculty of Social Science, Bar-Ilan University, Ramat Gan, Israel, completed his sabbatical year as a senior research associate, under the auspices of the National Research Council, National Academy of Sciences, with the Department of Psychobiology Department. He was involved in the application of lexican decision tasks on measuring the effects of stressors on decisionmaking. His expertise in many types of psychological testing and statistical analysis were an asset to the Department. He is not only a citizen of Israel, but also of the United States.

(Sep) Dr. Robert Pozos of the Sustained Operations Department, started teaching a General Physiology course to Physician Assistant students at Naval School of Health Sciences. The course is for nine months.

(Nov) RADM J. Prohl, Surgeon General of the German Navy, visited this Center on 7 November. The Center's research programs were presented as well as tours of the departments. His particular interests were in sustained operations, exercise related injury prevention (sport medicine), and epidemiology programs. As host, arrangements were made for him to visit EPMU-5 San Diego.

d. Major facility developments, including new construction and base right agreements.

MILCON Project P-002. Planned for 1993, this military construction project has completed the design phase for the development of a 35,000 square feet new facility for NHRC.

Relocatable Facilities: To relieve congested conditions at the present facilities, an order initiated in October 1989 to obtain and install four trailers providing approximately 2900 square feet of space on the seaward side of Point Loma of the Naval Ocean Systems Center, was delayed due to foundation, plumbing and access problems. A 1990 move in date was therefore put off.

e. Major accidents or casualties: None

f. Storage or disposal of hazardous waste: The Center cannot store hazardous waste. Generated hazardous waste is disposed of by Naval Ocean System Center's regulation.

g. Community Relations (including disaster relief):

* The command continues to participate in the annual Combined Federal Campaign, Navy Relief, and Navy Technology Transfer Program.

* The command participates in and supports the Great American Smokeout campaign. November 15 was designated the smokeout day; the theme as announced by RADM Halder was "Let's Take a Breather, San Diego." As a result of the national cease smoking programs, all of the command's office buildings have been designated as "No Smoking" areas.

g. Community Relations cont.

* On 6 December, the Equal Employment Office (EEO) of the Naval Ocean Systems Center, held a Multi-Cultural Program in which a diversity of ethnic and national groups were represented. At the invitation of the EEO, the Commanding Officer's secretary, Brenda Crooks, of the Navajo/Oneida Indian tribes, was invited to participate and was the Native American Indian representative. All participants were dressed in their native customs.

* Students from San Diego State University (SDSU) and the University of California at San Diego (UCSD) are utilized in the various departments as research assistants, or psychology and/or statistical technicians.

* Several members of our staff continue to teach in the evening at local colleges. Almost all of our senior scientists hold Adjunct Professorships at the local universities. These ties with local universities and colleges serve to keep our researchers up-to-date with the latest academic advances in their fields. These appointments also reflect a high level of acceptance of many of our staff and their work by academic appointment committees.

h. Records set or other unique and unusual events:

Since 1981, NHRC has not incurred any work related injuries or accidents that have resulted in employee work time lost.

i. Aircraft assigned: N/A

3. SUPPORTING DOCUMENTS

- Encl (1) Scientific Technical Reports:
- * List of 1990 Technical Reports and Publications
 - * Other Journal/Proceedings Publications in 1990
 - * Other Technical Reports Published in 1990
 - * Reports "in press"
 - * Other Published Articles (Abstracts/letters)
 - * Department Overview with Abstracts of 1990 Reports
- Encl (2) Biography and Photo of Commanding Officer
- Encl (3) * Organization Chart as of 31 December 1990
- * Staff Directory
 - * Boards, Committees, Collateral Duties
- Encl (4) * Reports of Major Conferences
- * Senior Officer's Reviews and Updates
- Encl (5) Major Command Awards
- * Civilians
 - * Military
- Encl (6) Logistic Support
- Booklets used for Military Orientation

1990 Command History-NHRC

Scientific Technical Reports

* List of 1990 Technical Reports and Publications (pg A1-A5)

* Other Journal/Proceedings Publications in 1990 (pg A6-A8)

* Other Technical Reports Published in 1990 (pg A8-A9)

* Reports "in press" (pg A9-A10)

* Other Published Articles (Abstracts/letters) (pg A10)

* Department Overview with Abstracts of 1990 Reports

Code 10 (pg B1 to B5)

Code 20 (pg C1 to C5)

Code 40 (pg D1 to D7)

Code 50 (pg E1 to E4)

Code 60 (pg F1 to F4)

Code 70 (pg G1 to G4)

Code 90 (pg H1 to H3)

Code 30 (pg I1 to I10)

Encl (1)

List of 1990 Technical Reports and Publications *

- | <u>Report No.</u> | <u>(Publication Date, AD#)</u> | |
|-------------------|---|--------------------|
| 90-1 | Hodgdon, JA, PI Fitzgerald, & JA Vogel (1991) | |
| | Relationships between Fat and Appearance Ratings of U.S. Soldiers | |
| | (Center Publication, A245-583) | [Abstract, pg B-3] |
| 90-2 | Nice, DS & S Hilton (1990) | |
| | Sex Differences in Health Care Requirements aboard U.S. Navy Ships | |
| | (Center Publication, A223-194) | [Abstract, pg D-3] |
| 90-3 | Garland, FC; ED Gorham, MR Miller, TM Hickey & LL Balazs (1990) | |
| | Cross-sectional Demographic Characteristics of Human Immunodeficiency | |
| | Virus Seropositive Navy and Marine Corps Active Duty Personnel | |
| | (Center Publication, A224-671) | [Abstract, pg F-2] |
| 90-4 | Weinger, MB & CE Englund (1990) | |
| | Ergonomic and Human Factors Affecting Anesthetic Vigilance and | |
| | Monitoring Performance in the Operating Room Environment | |
| | <u>Anesthesiology</u> , 73, 995-1021. A245-588 | [Abstract, pg I-4] |
| 90-5 | Nice, DS & LK Trent (1990) | |
| | Prevalence of Hypertension among Active Duty Navy Personnel | |
| | (Center Publication, A223-892) | [Abstract, pg D-4] |
| 90-6 | Linenger, JM; CV Chesson, & DS Nice (1990) | |
| | Physical Fitness Gains Following Simple Environmental Change | |
| | (Center Publication, A223-781) | [Abstract, pg F-3] |
| 90-7 | Burr, RG & LA Palinkas (1990) | |
| | Alcohol and Drug Abuse Hospitalizations among Submarine Personnel in | |
| | the U.S. Navy | |
| | (Center Publication, A224-793) | [Abstract, pg C-2] |
| 90-8 | Hoiberg, A (1990) | |
| | Gaining Control of Occupational Injury and Illness in the U.S. Navy | |
| | Civilian Work Force | |
| | (Center Publication, A224-792) | [Abstract, pg D-4] |

* The abstracts for the reports are located on the page number in brackets.

Report No.

- 90-9 Pugh, WM (1990)
The Effect of Combat Level on Disease and Non-battle Injury
(Center Publication, A224-754) [Abstract, pg C-3]

- 90-10 Hermansen, LA; MR White, WM Pugh, & EK Shaw (1990)
Disease and Non-battle Injury Rates for Marine Corps Enlisted Personnel
during Peacetime
(Center Publication, A224-795) [Abstract, pg C-3]

- 90-11 Kaszas, SL & DS Nice (1990)
An Evaluation of the Navy's Health Promotion Videotapes
(Center Publication, A224-794) [Abstract, pg D-4]

- 90-12 Wilcox, WW & WM Pugh (1991)
Evaluation of Revised Field Medical Card for Navy and Marine Corps
(Center Publication, A235-552) [Abstract, pg C-4]

- 90-13 Blood, CG & CB Nirona (1991)
Geographical and Temporal Variations in Outpatient Morbidity at U.S.
Navy Overseas Facilities
(Center Publication, A230-731) [Abstract, pg C-4]

- 90-14 Hackney, AC (1991)
A Simplified Version of the Wingate Anaerobic Power Test
(Center Publication, A231-024) [Abstract, pg B-4]

- 90-15 Kobus, DA & LJ Lewandowski
Reported Modality Preferences of Sonar Operators
(Center Publication, in press) [Abstract, pg G-2]

- 90-16 Blood, CG (1991)
Shipboard and Ground Troop Casualty Rates among Navy and Marine Corps
Personnel during World War II Operations
(Center Publication, A230-803) [Abstract, pg C-4]

- 90-17 Naitoh, P; TL Kelly & H Babkoff (1991)
Napping, Stimulant, and Four Choice Performance
(Center Publication, A230-306) [Abstract, pg E-3]
In RG Broughton & RD Ogilvie (Eds.), Sleep, Arousal, and Performance.
A Tribute to Bob Wilkinson, (in press)

Report No.

- 90-18 Hackney, AC; JM Shaw, JA Hodgdon, JT Coyne, & DL Kelleher
Military Operations in the Cold: Effects on Anaerobic-Muscular
Performance and Select Blood Indices
(Center Publication, A230-749) [Abstract, pg B-4]
- 90-19 Farrow, S; A Mers, G Banta, S Steigerwalt, & W Lockette (1990)
Effect of the α_2 -Adrenergic Antagonist Yohimbine on Orthostatic
Tolerance. Hypertension, 15(6)Part 2, 877-880, A235-012
[Abstract, pg I-5]
- 90-20 Gray, CG; OG Kilterman & DC Cutler (1991)
The Effects of a Three-week Adaptation to a Low Carbohydrate/High Fat
Diet on Metabolism and Cognitive Performance
(Center Publication) [Abstract, pg I-5]
- 90-21 Hodgdon, JA (1991)
Body Composition in the Military Services: Standards & Methods
(Center Publication, A230-435) [Abstract, pg B-5]
- 90-22 Woodruff, SI, TL Conway, JM Linenger
An Assessment of Pre- and Post-fitness Measures in Two Remedial
Conditioning Programs
(Center Publication, A230-365) [Abstract, pg D-5]
- 90-23 Burr, RG; GR Banta, JT Coyne, JA Hodgdon, & CV Chesson (1991)
Effect of a Passive Cooling Vest on Tension/Anxiety and Fatigue in a
High Heat and High Humidity Naval Environment
(Center Publication, A234-657) [Abstract, pg I-6]
- 90-24 Linenger, JM & LA West
Epidemiology of Soft-Tissue/Musculoskeletal Injury among U.S. Marine
Recruits Undergoing Basic Training [Abstract, pg F-3]
- 90-25 Kelly, TL & R Booth (1991)
A Keyboard for Underwater Performance Assessment Battery Testing
(Center Publication, A236-579) [Abstract, pg E-3]
- 90-26 Woodruff, SI & TL Conway (1991)
Impact of Health and Fitness-related Behavior on Quality of Life
(Center Publication, A232-811) [Abstract, pg D-5]

Report No.

- 90-27 Trent, LK (1991)
Nutrition Knowledge in the U.S. Navy
(Center Publication, A232-085) [Abstract, pg D-6]

- 90-28 Conway, TL; SL Hurtado & SI Woodruff (1991)
Tobacco Use Programs at Navy Commands: 1990 Survey Results
(Center Publication, A232-783) [Abstract, pg D-6]

- 90-29 Naitoh, P; GR Banta, T Kelly, J Bower & R Burr (1991)
Sleep Logs: Measurement of Individual and Operational Efficiency
(Center Publication, A239-775) [Abstract, pg E-4]

- 90-30 Banta, GR & D Braun (1991)
Heat Strain during At-sea Helicopter Operations in a High Heat Environment and the Effect of Passive Microclimate Cooling
(Center Publication, A242-152) [Abstract, pg I-6]

- 90-31 Banta, GR & RG Burr
Heat Strain and Use of Microclimate Cooling to Protect Shipboard Engine Room personnel working in High Heat [Abstract, pg I-7]

- 90-32 Farrow, S; GR Banta, S Schallhorn, A Mers, L Cadaret, L Rudstedt & W Lockette. Vasopressin Inhibits Diuresis induced by Water Immersion in Man [Abstract, pg I-7]

- 90-33 Goforth, HW Jr. & DA Arnall (1991)
Effectiveness of Glycerol Ingestion for Enhanced Body Water Retention during Cold Water Immersion
(Center Publication, A234-942) [Abstract, pg I-8]

- 90-34 Goforth, HW Jr.; JA Hodgdon, & N Seidle
SEAL Delivery Vehicle Operator Performance Measurement System and Test Scenarios for Biomedical Studies during Mission Simulations [Abstract, pg I-8]

- 90-35 Prusaczyk, WK; HW Goforth Jr., & M Nelson
Characteristics of Physical Training Activities of U.S. Navy Special Forces Team Members of Naval Special Warfare Group-ONE, NAB Coronado [Abstract, pg I-8]

Report No.

- 90-36 Buono, MT; J Heaney, GR Banta, D Dyar, R Bulbulian, & A Sucec (1991)
The Relationship between Vasoactive Intestinal Polypeptide and Whole-
body Sweat Rate During Exercise
(Center Publication) [Abstract, pg I-9]

- 90-37 Linenger, JM & CP Christensen
Iliotibial Band syndrome (ITBS) among U.S. Marine Recruits Undergoing
Basic Training [Abstract, pg F-4]

- 90-38 Merrill, LL; DA Kobus, & JA Rogale
An event-related Potential Evaluation of the Cognitive Performance of
U.S. Navy Alcoholics [Abstract, pg G-3]

- 90-39 Makeig, S
Predicting Lapses in Vigilance using Brain Evoked Responses to
Irrelevant Auditory Probes [Abstract, pg G-3]

- 90-40 Garland, FC; E Gorham, S Cunnion, M Miller, & L Balazs
Trends and Methods in Identification of Human Immunodeficiency Virus
(HIV) Seropositive Personel in Active-Duty U.S. Navy Enlisted
Personnel: 1986-1989
(Center Publication, in press) [Abstract, pg F-3]

- 90-41 Matteson, LT; TL Kelly, H Babkoff, S Hauser, & P Naitoh (1991)
Methylphenidate and Pemoline: Effects on Sleepiness and Mood during
Sleep Deprivation
(Center Publication, A 234-659) [Abstract, pg E-4]

- 90-42 Burr, RG; SI Woodruff, & GR Banta (1991)
Associations between Mood and Specific Health Composites during Navy
Persian Gulf Operations
(Center Publication, A234-656) [Abstract, pg I-10]

- 90-43 Conway, TL & TA Cronan (1991)
Smoking, Exercise and Physical Fitness
(Center Publication, A234-658) [Abstract, pg D-7]

**Other Reports Published
in Journals/Proceedings in 1990**

Blood, CG & CB Nirona (1990)

Outpatient Illness Incidence Aboard U.S. Navy Ships During and After the Vietnam Conflict. Military Medicine, 155(10), 472-476

(Report No. 89-15, 1989 Center Publication, AD# A211-210)

Blood, CG & DK Griffith (1990)

Ship Size as a Factor in Illness Incidence among U.S. Naval Vessels

Military Medicine, 155(7), 310-314

(Report No. 88-48, 1989 Center Publication, AD# A203-942)

Conway, SW & Conway, TL (1990)

Perceived Quality of Life and Health-related Correlates among Men Aboard Navy Ships. Military Psychology, 2(2), 79-94

(Report No. 88-43, 1988 Center Publication, AD# A204-022)

Garland, FC; EK Shaw, ED Gorham, CF Garland, MR White, & PJ Sinsheimer (1990)

Incidence of Leukemia in Occupations with potential Electromagnetic Field Exposure in United States Navy Personnel

American Journal of Epidemiology, 132(2), 293-303

(Report No. 89-2, 1989 Center Publication, AD# A224-665)

Garland, FC; E Shaw, ED Gorham, CF Garland, MW White & PJ Sinsheimer (1990)

Incidence of Leukemia in Occupations with Potential Electromagnetic Field Exposure in United States Navy Personnel

American Journal of Epidemiology, 132, (293-303)

Garland, FC; M White, C Garland, E Shaw, & E Gorham (1990)

Occupational Sunlight Exposure and Melanoma in the U.S. Navy

Archives of Environmental Health, 45(5), 261-267

also published:

Melanoma in U.S. Navy Personnel (1990)

In Schmid-Keiner, N; J Merke, F Wolff, EG Jung (Eds.), Biopositive Effects of Optical Radiation on Man. Proceedings of the First International

Arnold-Rikli Symposium. Germany: G Braun/Verlag.

(Report No. 88-27, 1988 Center Publication, AD# A211-922)

Gray, GC, LA Palinkas, & PW Kelley (1990)

Increasing Incidence of Varicella Hospitalizations in United States Army and Navy Personnel: Are today's teenagers more susceptible? Should recruits be immunized?

Pediatrics, 86(6), 867-873

(Report No. 89-33)

Gunderson, EKE (Ed.) (1990)

Proceedings, The Combined Effects of Multiple Stressors on Operational Performance (405 pp). 4-5 April 1989, San Diego, California. San Diego: Naval Health Research Center.

(Report No. 89-58, Center Publication, AD# A222-542)

Other Reports Published in Journals/Proceedings in 1990 cont.

- Johnson, LC: CL Spinweber, & SA Gomez (1990)
Benzodiazepines and Caffeine: Effect on Daytime Sleepiness, Performance, and Mood. Psychopharmacology, 101, 160-167
(Report No. 88-51, 1989 Center Publication, AD# A205-862)
- Johnson, LC; CL Spinweber, SA Gomez, & LT Matteson (1990)
Daytime Sleepiness, Performance, Mood, Nocturnal Sleep: The Effect of Benzodiazepine and Caffeine on their Relationship
Sleep, 13(2), 121-135
(Report No. 89-7, 1989 Center Publication, AD# A210-915)
- Kilbourne, G; J Goodman, & SM Hilton (1990)
Predictors of Disability Discharge Disposition for Navy Personnel with A Mental Health Problem. Military Medicine, 115(11), 542-545
(Report No. 88-40, 1988 Center Publication, AD# A206-059)
- Kobus, DA (1990)
The Operational Assessment of Human Performance during Sustained/Continuous Operations. In DF Neri & RE Gadolin (Eds.), Sustained/Continuous Operations Subgroup of the Department of Defense Human Factors Engineering Technical Group: Program Summary and Abstracts from the 9th Semiannual Meeting. (NAMRL Report SR90-1)
- Naitoh, P, TL Kelly, & CE Englund (1990)
Health Effects of Sleep Deprivation
Occupational Medicine: State of the Art Reviews, 5(2) Apr-Jun, 209-237
(Report No. 89-46, 1990 Center Publication, AD# A223-916)
- Nice, DS & SM Hilton (1990)
Determinants of the Delegation of Healthcare Aboard Ships with Women Assigned. Military Medicine, 155(11), 546-548.
(Report No. 89-23, 1989 Center Publication, A212-997)
- Nice, DS & SI Woodruff (1990)
Self-selection in Responding to a Health Risk Appraisal: Are we preaching to the choir?
American Journal of Health Promotions, 4(5), 367-372
(Report No. 89-28, 1989 Center Publication, A212-897)
- Oldfield, EC III; PD Garst, C Hostettler, M White, & D Samuelson (1990)
Randomized, Double-Blind Trial of 1- versus 4-Hour Amphotericin B Infusion Durations. Journal of Antimicrobial Agents and Chemotherapy, 34, 1402-1406
- Palinkas, LA (1990)
Group Adaptation and Individual Adjustment in Antarctica: A Summary of Recent Research (pp 239-251). In AA Harrison, YE Clearwater, & CP McKay (Eds.), From Antarctica to Outer Space. Life in Isolation and Confinement. New York: Springer/Verlag. FORWARD by Dr. Gunderson. [Based on the Proceedings of the Human Experience in Antarctica Applications to Life in Space, 17 Aug 87, Sunnyvale, California]
(Report No. 87-24, 1987 Center Publication, A186-605)

Other Reports Published in Journals/Proceedings in 1990 cont.

- Palinkas, LA; TS Pineda, KC Hyams, & RG Burr (1990)
Ten-Year Profile of Infectious and Parasitic Disease Hospitalizations in
the U.S. Navy. Military Medicine, 155(9), 401-405
(Report No. 89-4, 1989 Center Publication, AD# A210-899)
- Vickers, RR Jr., TL Conway, & LK Hervig (1990)
Demonstration of Replicable Dimensions of Health Behaviors
Preventive Medicine, 19, 377-401
(Report No. 88-41, 1989 Center Publication, AD# A211-920)
- White, MR & MS McNally (1990).
Morbidity and Mortality in U.S. Navy Personnel from Exposure to Hazardous
Materials, 1974-85. Military Medicine, 156(2), 70-73
(Report No. 89-12, 1989 Center Publication, A213-067)

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Other Technical Reports Published in 1990

- Abood, DA & TL Conway (1990)
Health Value and Self-esteem as Predictors of Wellness Behaviors
(Report No. 89-27, Center Publication, AD# A223-920)
- Banta, GR & CE Englund (1990)
Sustained Operations Research: A Blend of Psychology and Physiology
(Report No. 89-54, Center Publication, A223-930)
- Buono, MJ; AA Sucec, J Yeager, & CE Englund (1990)
The Effects of Various Back Pack Loads on Serum Creatine Phosphokinase
(Report No. 89-52, Center Publication, A223-817)
- Burr, RG; LM Palinkas, GR Banta, MW Congleton, DL Kelleher, & CG Armstrong
(1990). Physical and Psychological Effects of Sustaining Shipboard
Operations on U.S. Navy Personnel
(Report No. 89-18, Center Publication, A224-791)
- Du Bois, BC; JD Goodman, & TL Conway (1990)
Dietary and Behavioral Prediction of Obesity in the Navy
(Report No. 89-56, Center Publication, A223-919)
- Dunbar, J & A Gino (1990)
Neural Networks and Their Possible Use in Computer-Assisted Diagnosis
(Report No. 89-42, Center Publication, AD# A223-917)
- Gino, A, WM Pugh & DH Ryman (1990)
MUMPS Based Integration of Disparate Computer-Assisted Medical Diagnosis
Modules (Report No. 89-43, Center Publication, AD# A223-918)

Other Technical Reports Published in 1990 cont.

- Hoiberg, A & MS McNally (1990)
Profiling Overweight Patients in the U.S. Navy: Health Conditions and Costs. (Report No. 89-55, Center Publication, AD# A223-819)
- Leake, CN; A Langer, CE Englund, & M Sinclair (1990)
Optimism and Cardiovascular Reactivity to Psychological and Cold Pressor Stress. (Report No. 89-53, Center Publication, A223-818)
- Lewandowski, L; DA Kobus, & MM Flood (1990)
Bimodal Word Processing: Speed, Accuracy, and Memory (Report No. 89-44, (Center Publication, AD# A224-666)
- Naitoh, P (1990)
Minimal Sleep to Maintain Performance: Search for Sleep Quantum in Sustained Performance (Report No. 89-49, Center Publication, A223-815)
- Pugh, WM; MR White, & CG Blood (1990)
Disease and Non-battle Injury Rates for Navy Enlisted Personnel during Peacetime. (Report No. 89-51, Center Publication, AD# A224-607)
- Pugh, WM (1990)
A Strategy for Computing Disease and Non-battle Injury Rates (Report No. 89-45, Center Publication, AD# A223-916)
- Trent, LK (1990)
Prevalance of Elevated Serum Cholesterol among Active Duty Navy Personnel (Report No. 89-50, Center Publication, AD# A223-816)
- Vickers, RR; TL Conway, & LK Hervig (1990)
Confirmatory Factor Analysis Test of an Hierarchical Model of Health Behaviors (Report No. 89-40, Center Publication, AD# 223-931)
- Vickers, RR; DW Kolar, & DL Kelleher (1990)
Coping Strategies and Mood during Cold Weather Training (Report No. 89-47, Center Publication, AD# A223-915)

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Reports "in press"

- Coyne, JT
Human Performance at the Roof of North America
Human Factors Society, (in press)
- Coyne, JT
High Altitude Sojourn: Effects on Body Composition
Wilderness Medicine Journal, (in press)
- Coyne, JT
Military Operations At Moderate Altitude: Effects of Physical Performance
Military Medicine, (in press)

Reports "in press" cont.

Naitoh, P.

Minimal Sleep to Maintain Performance: Search for Sleep Quantum in Sustained Performance. In C Stampi & R Boughton (Eds.), Polyphasic and Ultra Short Sleep Wake Patterns. Boston: Birkhauser, Inc. (in press).
(Report No. 89-49, 1990 Center Publication, AD# A223-815)

White MR, FC Garland, CR Garland, E Shaw, & E Gorham

Malignant Melanoma in U.S. Navy Personnel
Archives of Environmental Health (in press)
(Report No. 88-27, 1988 Center Publication, AD# A211-922)

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Other Published Articles

Letter(s)....

Garland, CF; ED Gorham, & FC Garland (1990)

Physical Activity, Diet, and Risk of Colon Cancer in Utah (Letter)
American Journal of Epidemiology, 131, 467-569

Abstracts....

Matteson, LT (1990)

The Effectiveness of Methylphenidate and Pemoline in Reducing Sleep Loss Effects on Objective and Subjective Sleepiness and Mood
Sleep Research, p. 75

Heaney, HJ; MB Beckett, JA Hodgdon & JEL Carter (1990)

Skill Acquisition for Selected Skinfold and Circumference Measurements
Medicine and Science in Sports & Exercise, 22(2), s112

Hodgdon, JA; M Reidy, HW Goforth, E Harper, & AC Vailas (1990)

Exercise Intensity Change, Bone Mineral and Connective Tissue Degradation
Medicine and Science in Sports & Exercise, 22(2), s62

Shaw, JM; AC Hackney, DL Kelleher, JA Hodgdon, & JT Coyne (1990)

Military Field Operations in Cold Weather: Effects on Anaerobic Performance
Medicine and Science in Sports & Exercise, 22(2), s38

Vailas, AC; P Griffith, M Murguia, M Riedy, HW Goforth, & JA Hodgdon (1990)

A Plasma Marker for Monitoring the Extracellular Degradation of Collagen during Exercise Training in Man
Medicine and Science in Sports & Exercise, 22(2), s132)

OPERATIONAL PERFORMANCE DEPARTMENT (10)

James A. Hodgdon, Ph.D.

Program Manager: Robert Pozos, Ph.D.

a. Department Mission and research program descriptions.

Carries out research assessing relationships between physiological, psychological, health, nutrition, and physical fitness variables and their effects on physical and mental performance of Navy and Marine Corps personnel in a variety of operational environments. Based upon our research, this Department develops programs to measure and prevent degradation of military performance and enhance restoration of operational capability, and develops standards for the evaluation of operational readiness of Navy and Marine Corps personnel.

During this reporting period, work in this department focused in four areas: Measurement and prediction of cold weather induced combat performance decrements of U.S. Marine Corps personnel; development of a program for treatment of training related musculoskeletal injuries in Navy recruits; determination of the effect of skin blood flow on bioelectrical impedance; and identification of risk factors for infectious disease.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

Personnel:

* Dr. Ross Vickers and Ms. Linda Hervig left the department 1 May 90 to form a new department dealing with stress immunology.

* Ms. Patricia Coben joins the department as a computer specialist.

* Dr. Bob Moffatt, Florida State University, Tallahassee, joins the department for the summer as an ASEE and conducts a research project on measurement of residual lung volume.

* Dr. Jean Boucher, University of Quebec at Montreal, is contracted to assist in the Navy Recruit Medical Rehabilitation Program

* LCDR John T. Coyne, MSC, USN (Aug-Dec). Lieutenant Commander Coyne deployed TAD to Desert Shield as the Commanding Officer of Foxtrot Surgical Support Company, 1st Medical Battalion, 1st Force Service Support Group, Camp Pendleton. The 150 bed field hospital and staff of 285 arrived in Saudi Arabia on 27 Aug 1990. Fully operational in only 10 days Foxtrot Surgical Support Company was the first Field hospital established in the Theater of Operation. As the ground war became eminent he moved his Company up to the Kuwait border and supported the 1st Marine Divisions attack into Kuwait. Foxtrot Company treated 1800 patient and performed 200 major trauma surgeries during their 7+ months of deployment. Throughout the war LCDR Coyne collected disease non-battle injury data for NHRC, providing a valuable database for use by the Center. For his leadership LCDR Coyne was awarded the Bronze Star Medal.

1990 Command History-NHRC

* LT Robert Hesslink, MSC, USNR reported to the command and joins the department in August and becomes the Principle Investigator of the Cold Research Program.

* CDR John Aronen, MC USN transferred to Naval Clinics Command, San Diego.

* Dr. Tony Hackney, University of N. Carolina at Chapel Hill, a contractor, assists in the Cold Research Program.

(2) Major accomplishments

Data Exchange Agreement (DEA) between NMRDC laboratories and the Norwegian Army is signed and the first study under the DEA is carried out.

Two follow-up studies of Marine Corps performance in the field in cold and at altitude are completed. A new test battery of four simulated combat tasks and two physical capacity measures is developed and implemented. Risk factors for infectious disease are assessed.

The International Cold Symposium, hosted by this Center's Department, was held 13-15 February 1990 at Minden, Nevada.

MicroSAINT model is developed to predict effects of load carriage from existing U.S. Army equations.

The Medical Rehabilitation Program continues to treat and monitor training related musculoskeletal injuries at the Recruit Training Command, Naval Training Center, San Diego. A system for tracking injuries is developed and implemented.

Two studies are conducted to determine a model for prediction of musculoskeletal injury from a variety of anthropometric, morphological, and functional measures. One study is cross-sectional in design and uses Marine Corps recruits as subjects, while the other study is longitudinal, involves Navy recruits, and is a joint effort with Stress Medicine Department, Code 90.

A study to evaluate a modified BUD/S boot is conducted under contract, at Children's Hospital, San Diego

An Independent Research project (6.1) investigating the effect of changes in skin blood flow on bioelectrical impedance is completed.

A study to determine the validity of three different methods of measuring residual lung volume is completed.

LT Hesslink directs a microclimate cooling research project in support of Desert Shield.

A Naval Coastal Systems Center reimbursable project examining the energy expenditure and heat production of divers wearing dry suits and swimming in cold water is begun.

(3) Impact on Navy and Marine Corps mission.

Follow-up studies replicated the findings that current Marine field practices lead to a decrement in anaerobic power. However, in the presence of adequate food and sleep, there is no measured degradation in combat task performance during cold weather operations.

The Medical Rehabilitation Program's treatment and tracking system results in significantly greater retention of Navy recruits

The shock absorbency of the modified BUD/S boot does not differ significantly from that of the jungle boot.

Changes in whole body bioelectrical impedance were significantly and inversely related to changes in skin blood flow.

(4) Technology transfer items of Interest. N/A

c. Work Units

Current:

Naval Coastal Systems Ccenter Reimbursable, NEW, Use of Liquid Crystals in Diver Thermal Protection (Hodgdon/Pozos, PIs)

63706N M0096.002-6003 [DN248539] "Cold Related Combat Performance Decrements" (Coyne, PI)

Completion

61152N MR0000.01.01-6041 [DN240520] "Effect of Skin Blood Flow on Bioelectrical Impedance" (Beckett, PI)

d. Reports for 1990 include:

90-1 Hodgdon, JA, PI Fitzgerald, & JA Vogel
 RELATIONSHIPS BETWEEN FAT AND APPEARANCE RATINGS OF U.S. SOLDIERS
 (1992 Center Publication)
 Work Unit No.: U.S. Army Reimbursable

Abstract: Military Service requirements to maintain physical appearance drive, in part, the service standards for maximum weight for height and/or body composition. This report considers two issues: 1) how strongly are ratings of "military appearance" and fatness associated; and 2) can reliable, valid assessments be made visually in a military population which includes both genders and contains members of varying race and age. A panel of 11 U.S. Army headquarters staff personnel made visual ratings of 1,075 male and 251 female U.S. Army personnel from photographs of the subjects both in uniform and in swimsuit. Subjects were rated for "appearance" in both uniform and swimsuit, using a 5-point scale, and for "fatness" in swimsuit using a 7-point scale developed by Blanchard and coworkers. Inter-rate reliabilities of the scales were 0.86, 0.90,

0.92 for appearance in uniform, appearance in swimsuit, and fatness in swim-suit, respectively. Correlations between ratings and percent fat from hydrodensitometry were 0.53, 0.69, and 0.78 for appearance in uniform, appearance in swimsuit, and fatness, respectively for males in this sample. Similar correlations were 0.46, 0.60, and 0.72 for females. Analysis for variance using percent body fat as a covariate revealed significant gender and race main effects and a gender by age interaction in ratings of appearance in uniform; gender and age by gender effects in ratings of appearance in swimsuit; and a gender effect in ratings of fatness. For a given percent body fat value, a woman received a higher rating of military appearance. The inter-action appears to reflect an increased sensitivity in rating older females younger females or males of either age group. Similarly, for a given percent fat value, a black soldier received a higher rating of military appearance. Validities for prediction of percent body fat from ratings of fatness approach those for prediction from anthropometric variables. Major findings are: 1) ratings of appearance to involve more than a consideration of the individuals' fatness and 2) visual ratings of fatness appear to be valid, reliable indicators of percent body fat.

90-14 Hackney, AC

A SIMPLIFIED VERSION OF THE WINGATE ANAEROBIC POWER TEST

(1990 Center Publication, AD# A231-024)

Work Unit No.: (63706N) M0096.002-6003

Abstract: A study was undertaken to develop a modified Wingate anaerobic power (WAP) test that could be administered with a minimum of equipment and personnel. This study was done in the summer of 1989, under contract with the University of North Carolina. The accuracy of using the time to pedal either 240, 270, or 300 M (at a resistance of 0.095 kp/kg of body weight) on a stationary ergometer as a predictor of mean power output from a standard WAP was examined. Forty-four healthy male volunteers participated in the study. Significant correlations were found between completion time and the standard WAP mean power output, however, extensive predictive error (15%), was found to exist when the bivariate regressions from the correlation analyses were used to estimate mean power output. Multiple regression analysis, however, indicated that use of time to completion, and exercise resistance setting as independent variables resulted in highly significant multiple R values (0.98 to 0.99), and relatively accurate predictive capability (3% error). Based upon the statistical results, as well as practical trials completed by this investigator, a protocol employing a pedaling distance 0 M is recommended. The time to complete this distance at a 0.095 kp/kg of body t resistance can be used to predict mean power.

90-18 Hackney, AC; JM Shaw, JA Hodgdon, JT Coyne, & DL Kelleher
**MILITARY OPERATIONS IN THE COLD: EFFECTS ON ANAEROBIC-MUSCULAR
PERFORMANCE AND SELECT BLOOD INDICES**

(1990 Center Publication, AD# A230-749)

Work Unit No.: (61153N) MR041.01.00A-6004

Abstract: This study examined the effects of military field operations (MFO) under different environmental conditions on anaerobic performance (ANP).

U.S. Marines were tested in the field under the following conditions: 1) non-cold environment (NC; n=30, 10 to 32°C), and 2) a cold environment (CO; n=32, -2 to -22°C). Subjects performed 30 sec Wingate tests (WIN), 2 min push-ups, and hand-grip strength pre- and immediately post-MFO to assess ANP. The MFO consisted of 4.5 days of combat training maneuvers while carrying field equipment. WIN measures obtained were absolute and relative mean power (MP), 5 sec peak power (PP), and fatigue index (FI; % decline). Significant main effects were observed for time (pre-post MFO). Reductions occurred in absolute MP however, no effect on FI was seen. Significant interaction effects were observed in relative measures. Reductions (pre-post) in MP and PP were greater under CO than NC conditions. These changes were found but comparable, pre-post weight reductions in both C and NC conditions. No changes were observed for the push-up or hand-grip tests. Results of blood-urine profiles (pre- to post-MFO) suggested tissue damage and substrate inavailability were contributors to decreases in MP and PP. The data suggest: 1) WIN performance is reduced by participation in MFO, and 2) cold exposure augments these responses when accounting for body weight changes.

90-21 Hodgdon, JA
BODY COMPOSITION IN THE MILITARY SERVICES: STANDARDS & METHODS
 (1990 Center Publication, AD# A230-435)
 Work Unit No.: (63706N) M0096.002-6003

Abstract: This paper deals with two topics: The development of body composition standards in the U.S. Navy; and the methods of body composition assessment in use by the military services today. In 1981, the services were directed to develop body composition and fat standards consistent with the mission of the services. Three concerns were outlined which dictated the establishment of weight control policy: 1) body composition was an integral part of physical fitness; 2) body composition is a determinant of appropriate military appearance; and 3) body composition is a determinant of general health and well-being of military personnel. Each of these three concerns was explored as a basis for setting standards for body composition in the Navy. Our investigations of relationships between body composition variables and performance of materials handling tasks suggest that percent fat is not strongly related to such performance. Estimated fat-free mass, on the other hand, is highly correlated with strength and the ability to lift objects. Investigations of relationships between rated military appearance and percent body fat by Vogel and colleagues reveals military appearance can be determined reliably, and that percent body fat is only moderately well correlated with military appearance ($r=0.53$ for men; 0.46 for women). Fatness was not found, by itself, to be a reasonable indicator of military appearance. It was concluded that the equations in use by the military services have similar validities and standard errors of measurement to other published generalized anthropometric equations, and would appear to be reasonable, useful estimators of body composition.

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MEDICAL DECISION SUPPORT DEPARTMENT (Code 20)

William M. Pugh

Program Manager: D. Stephen Nice, Ph.D.

a. Department Mission and research program descriptions.

Plans and conducts research programs designed to study the processing of medical information. Methods that enhance the processing and analysis of medical information are developed and evaluated to determine how available data can be consolidated and be presented in a way so the information can be comprehended and communicated rapidly.

Develops rapid retrieval and statistical forecast methods to project morbidity in Navy and Marine Corps populations. Methods for providing medical personnel with timely medical diagnosis or treatment information are developed, and methods for maintaining the continuity of patient care as well as the management of illnesses and injuries are studied and evaluated. These medical decision support capabilities provide medical planners the information needed to manage and allocate medical resources effectively.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

Two new work units were initiated. One, the Development of Methods for Improving Medical Data Collection at Forward Echelon of Care," is a follow-on effort to compute casualty rates for the Navy and Marine Corps. The second work unit, "Development of Medical Management Tools," is an effort to update the Navy's epidemiologic capabilities.

(2) Major accomplishments

Disease and Non-battle Injury (DNBI) data were analyzed for Navy and Marine Corps personnel. For each service, separate rates were developed for geographic region and the type of force. In addition, the effect of combat intensity was computed. These results were used to develop a matrix designed to show a medical planner the dynamic relationships among inpatient rates, outpatient rates, and the level of combat intensity.

Through participation with the Wartime Healthcare Documentation work group, a revised Field Medical Card was developed. Field testing of the revised card showed that additional revisions were needed. The working group used the data from NHRC to develop the final version of the new Field Medical Card.

A data base of Battle Injury information as developed which contains summary information on all casualties aboard Navy vessels during World War II, and detailed information on battle injuries aboard 523 major combatants and 474 nono-major combatants. Also, included is information on Navy and Marine Forces ashore during World War II and Marine Corps Casualty data from Vietnam. Analyses were conducted to determine the casualty rates for the patient conditions used by the

medical supply system. In addition, casualty rates were computed for particular ships and ship types, as well as all major ground operations during world War I

A Computer Assisted Medical Diagnosis system was developed and demonstrated. This system is a "shell" which accepts various types of knowledge bases and uses the knowledge provided to prompt the user for the patient sign and symptom information to be used to project a probably diagnosis. The system will accept, without programmer intervention, knowledge in the form of rule based, bayesian, neural network, or regression algorithms.

(3) Impact on Navy and Marine Corps mission.

Results from the Disease and Non-battle Injury (DNBI) and Battle Injury (BI) analysis were provided to medical planners at the Medical Doctrine Center, OP-932, OP-601 and at the 1st Force Service Support Group (1st FSSG) during planning for Desert Shield. The data collection systems developed to gather DNBI and BI data were implemented during the Desert Shield and Desert Storm operations to collect data for future evaluation and analysis. When deployed, the computer assisted diagnosis package will provide support to independent duty corpsmen.

(4) Technology transfer items of Interest.

The "Shell" developed for the computer assisted diagnosis project is flexible and has the potential to be used in other areas by supplying the system with the appropriate knowledge base.

c. Work Units

(63706N) M0095.005-6004 [DN246555], Projection of Disease and Non-battle Injury (DNBI) for the Navy and Marine Corps (Hermansen, PI)

(63706N) M0095.005-6050 [DN249506], Determination of Specific Casualty/ Injury Condition Rates for Navy and Marine Corps Operational Scenarios (Blood, PI)

(63706N) M0095.005-6051 [DN249523], Computer-Assisted Medical Diagnosis/ Patient Management in Isolated Environments (Pearsall, PI)

(63706N) M0095.005-6102 [DN241534], Development of Methods for Improving Medical Data Collection at Forward Echelons of Care (Wilcox, PI)

(63706N) M0095.005-6103 [DN241535], Development of Medical Management Tools (Pearsall, PI)

d. Reports for 1990 include:

90-7 Burr, RG & LA Palinkas
ALCOHOL AND DRUG ABUSE HOSPITALIZATIONS AMONG SUBMARINE PERSONNEL IN
THE U.S. NAVY
(1990 Center Publication, AD# A224-793)
Work Unit No.: (63706N) M0095.005-6004

Abstract: This study evaluated alcohol and drug abuse risks associated with U.S. Navy submarine duty by comparing hospitalization rates of submariners with

surface-ship personnel for five occupational groups. Occupational groups included administrative/clerical, apprentice, blue collar, electronic/technical, and medical personnel who were compared between ship type using age-adjusted hospitalization rates for alcohol and drug abuse related diagnoses. For alcohol abuse, submarine personnel had significantly lower hospitalization rates than surface-ship personnel for each of the five occupational groups. Hospitalization rate for alcohol abuse across all occupational groups for submariners was less than one-half the rate for surface-ship personnel. For drug abuse hospitalizations, submarine personnel had a significantly lower rate in the blue collar occupations. Hospitalization rate for drug abuse across all occupational groups for submariners was about one-half the rate for surface-ship personnel. Reasons for lower alcohol and drug abuse among submariners may be stringent screening, higher levels of education, and severe penalties for substance abuse for submariners.

90-9 Pugh, WM

THE EFFECT OF COMBAT LEVEL ON DISEASE AND NON-BATTLE INJURY

(1990 Center Publication, AD# A224-754)

Work Unit No.: (63706N) M0095.005-6004

Abstract: Disease and Non-battle Injury (DNBI) rates may differ between peacetime and wartime because of differences in patient handling as well as physiological factors. Therefore, peacetime DNBI rates may not be proper estimates of wartime DNBI rates. To determine the effect of combat level on DNBI rates, Navy and Marine Corps data gathered since 1980 was compared to data gathered during Vietnam and during World War II. It was found that wartime DNBI rates were higher than peacetime rates. Further, this difference was found to be more pronounced for inpatient rates than for outpatient rates. These results were used to create a matrix for medical planners showing the relationship between outpatient rates, inpatient rates, and level of combat.

90-10 Hermansen, LA; MR White, WM Pugh, & EK Shaw

DISEASE AND NON-BATTLE INJURY RATES FOR MARINE CORPS ENLISTED PERSONNEL DURING PEACETIME

(1990 Center Publication, AD# A224-795)

Work Unit No.: (63706N) M0095.005-6004

Abstract: Inpatient data for shore-based U.S. Marine Corps personnel serving in specified world-wide geographical regions during 1980-1984 were extracted from historical medical files. Outpatient data were collected from a sample population of Marines serving aboard U.S. Navy ships during 1989 deployments. These data were matched against population data to provide in-patient and outpatient DNBI rates for specific geographical regions. Rates were computed for each of the major illness and injury categories defined in the International Classification of Diseases, 9th Revision (ICD-9). The area with the highest overall hospital admission rates for shore-based Marines was the Northeast Asia region. The highest number of hospital admissions in all regions was for the Injury and Poisoning category, followed by Mental Disorders and Diseases of the Digestive System. The area with the highest outpatient visit rates for deployed shipboard Marines was the European region (Atlantic/Mediterranean). The highest outpatient visit rates in all regions were for diseases of the Digestive System in Europe and Northeast Asia, and Diseases of the Respiratory System in Southwest

Asia. Although these results reflect DNBI rates under peacetime conditions, it is expected that these data will be useful in developing projections for overseas medical support requirements in times of conflict.

90-12 Wilcox, WW & WM Pugh

EVALUATION OF REVISED FIELD MEDICAL CARD FOR NAVY AND MARINE CORPS

(1991 Center Publication, AD# A235-552)

Work Unit No.: (63706N) M0095.005-6004

Abstract: This Center evaluated a revised Field Medical Card developed by a quad-service working group. Field testing as well as testing under controlled conditions was conducted to determine whether or not the proposed card was an improvement over the current card. With respect to the criteria of Sufficiency, Ease of Use, and Simplicity, some deficiencies of the old card persisted and some new problems were introduced. Therefore, it was concluded that some further revisions should be made to the Field Medical Card.

90-13 Blood, CG & CB Nirona

GEOGRAPHICAL AND TEMPORAL VARIATIONS IN OUTPATIENT MORBIDITY AT U.S. NAVY OVERSEAS FACILITIES

(1990 Center Publication, AD# A230-731)

Work Unit No. (63706N) M0095.005-6050

Abstract: Differences in outpatient morbidity were found to exist between shore stations in East Asia and Europe. The facilities in Europe consistently yielded lower illness rates than those in the Pacific region. The highest rate among the seven regions investigated was seen in Bahrain. Minor fluctuations in illness incidence by quarter were evidenced for Japan and the Philippines while Bahrain showed considerable variation by time period. Increases in disease rates were quite stable across quarters for facilities in Europe and the United Kingdom. The minor elevations in morbidity rates for the European regions paralleled increases in rainfall or decreases in temperature. Outpatient rates fluctuated much more by region than they did by season within regions.

90-16 Blood, CG

SHIPBOARD AND GROUND TROOP CASUALTY RATES AMONG NAVY AND MARINE CORPS PERSONNEL DURING WORLD WAR II OPERATIONS

(1990 Center Publication, AD# A230-803)

Work Unit No.: (63706N) M0095.005-6050

Abstract: Casualty rates were calculated for ships participating in World War II operations and Marine assault forces involved in the capture of Western Pacific islands. The rate of shipboard casualties in the Asiatic-Pacific theater across all operations was 0.56 per 1000 per day, while the rate in the European theater was 0.84. Individual ship-based operations ranged from 0.01 to 50.50. Among afloat operations there were 115 men wounded for every 100 killed. Eight ship types had KIA rates more than double their WIA rates; among these only submarines and oilers involved more than 10 vessels. Ground assault force rates averaged 15 times higher than the ship rates. Combat troop rates declined

dramatically after the first day of the operations. The highest rates for both afloat and ashore operations were seen for brief engagements occurring early in the war.



Manual

Field Study: Development of Medical Tag for Automated Medical Data Selection



Automated

HEALTH SERVICES DEPARTMENT (40)

Head: Anne Hoiberg

Program Manager: Dr. D. Stephen Nice

a. Department Mission and research program description.

This Department applies scientific theories, principles, and methods to research in the promotion and maintenance of health; the identification of etiologic and diagnostic correlates of health, illness, and related dysfunctions; and the analysis and improvement of the naval health care system, thereby providing data to aid in Navy health policy formation. In addition to studies of correlates of illness in selected naval populations, the Department conducts research on naval health care facilities to examine the organizational factors associated with effective, high quality health care delivery in shipboard and shore-based environments.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

Personnel: Reporting onboard in November was Suzanne Hurtado, working with the Tobacco Use Project under the Health and Physical Readiness Program, and TAD for six months, LCDR Larry Shaw, DC, USN to assist with two projects, the "Dental Corps Survey" and "HIV Seropositivity and Ethnic/Minority Status in the U.S. Navy."

(2) Major accomplishments

The research programs in this department are focused on health promotion, health and physical readiness, HIV seropositivity and ethnic/minority status, family violence, case management of Navy occupational injuries, health care requirements for women aboard ships, and career intentions of Navy Dental Corps officers. Each of these programs is designed to provide direct decision support to Navy medical and operational planners in areas identified by higher authority.

* Several subprojects of the Health and Physical Readiness Program Evaluation work unit were conducted by Dr. Terry Conway, Ms. Linda Trent, Ms. Susan Woodruff, Ms. Suzanne Hurtado, Ms. Anne Hoiberg, and their colleagues. During 1990 seven technical reports were completed in the following areas:

- (a) determining the prevalence of hypertension among active-duty Navy personnel,
- (b) evaluating the Navy's health promotion videotapes,
- (c) assessing pre- and post-fitness measures into two remedial condition programs,
- (d) assessing nutrition knowledge among U.S. Navy personnel,
- (e) evaluating the impact of health and fitness-related behavior on quality of life,
- (f) determining the types and prevalence of tobacco use programs at Navy commands, and
- (g) examining the relationships among smoking exercise, and physical fitness.

In addition, three prior technical reports were published, one in the American Journal of Health Promotion regarding health risk appraisal feedback, another in Military Psychology on health related correlates of perceived life quality, and the third in Preventive Medicine assessing replicable dimensions of health behaviors. Information from these research projects also was presented at scientific meetings held during 1990. Other major research efforts initiated during 1990 included: the development and evaluation of a tracking system for health promotion data, a study of the feasibility of using a walk test in the Physical Readiness Test, and an evaluation of the Navy's healthy back program.

* The Operational Navy Medical Support program conducted by Dr. Stephen Nice and Ms Susan Hilton, addresses two issues in 1990. First, work on health care requirements for women aboard ships was completed. Final results and recommendations were presented to VADM Zimble, RADM Buckendorf, RADM Stertz, RADM Loar, Force Medical Officers, and the Naval Military Personnel Command's Women at Sea Task Force. Results also were presented at scientific meetings. Publications included a technical report and journal article. Second, a survey of the Navy Dental Corps was conducted to assess factors associated with career intentions and organizational climate. Results of this study were presented to RADM Clegg, and to the Commanding Officer's Conference during the 97th Annual Meeting of Association of Military Surgeons of the U.S. A technical report is being prepared.

* A research endeavor on the study titled "HIV Seropositivity and Ethnic/Minority Status in the U.S. Navy" is conducted by Ms. Anne Hoiberg, Jack White, Dr. Frank Garland, and LCDR Larry Shaw, DC, USN. Results of the first study report completed identified populations that should be targeted to receive HIV intervention and prevention education in efforts to reduce the incidence rate of HIV seropositivity. These findings as well as other information on demographic and career characteristics on HIV seropositives were presented at the "Workshop on the Epidemiology of Retrovirus Infections" in Bethesda, Maryland. Other technical reports being prepared have examined active-duty status and reasons for separation as well as clusters of diseases that occurred prior to HIV testing among HIV seropositives.

* The "U.S. Navy Occupational Illness and Injury Medical Case Management Study" conducted by Ms. Anne Hoiberg and Jack White was completed during 1990. This research endeavor produced a technical report that described the Navy Occupational Injury and Illness Case Management Process (NAVCAMPRO) which was designed to coordinate the medical care of occupationally injured and ill Navy civilian employees, to manage all facets of these cases, and to reduce the high costs of medical care and compensation. Recommendations resulting from this study included the implementation of NAVCAMPRO as well as return-to-work plans, light-duty job opportunities, training programs, a Create-a-Returned Employee (CARE) program, and an evaluation study of the effectiveness of NAVCAMPRO. Implementation of this case management process was expected to have any impact on cost containment efforts by saving the Department of the Navy compensation and medical care costs.

(3) Impact on Navy and Marine Corps mission.

Efforts above have an impact on both the Navy and Marine Corps.

(4) Technology transfer items of Interest. None

c. Work Units

Current:

63706N M0095.005- and NAVMILPERSCOM Reimbursable [DN248511] "Health and Physical Readiness Program Evaluation" (Conway, PI)

65152N M0106.001-6001 [DN247503] "Operational Navy Medical Support" (Hilton, PI)

U.S. Army Reimbursable, "HIV Seropositivity and Ethnic/Minority Status in the U.S. Navy" (Hoiberg, PI)

Termination:

NAVSEA Reimbursable, "U.S. Navy Occupational Illness and Injury Medical Case Management Study" (Hoiberg, PI)

d. Reports for 1990 include:

90-2 Nice, DS & S Hilton
SEX DIFFERENCES IN HEALTH CARE REQUIREMENTS ABOARD U.S. NAVY SHIPS
(1990 Center Publication, AD# A223-194)
Work Unit No.: (65152N) M0106.001-6001

Abstract: In response to a request from the Bureau of Medicine and Surgery, this study was conducted to identify health care requirements of women aboard Combat Logistics Force ships and recommend medical department adjustments to meet those requirements. From October 1988 to October 1989, summary patient data were collected quarterly from 20 ships representing 62,671 patient sick call visits. Approximately one-fourth of the crew members were women. Additional male and female patient encounter data were collected during November 1988 and June 1989 from 12,542 detailed sick call log entries aboard 20 ships. Results demonstrated that the monthly sick call rate for women was greater than the monthly rate for men. Although sex differences in rate were greatest for genitourinary disorders, women visited sick call more than men for most illness categories. About 25% of all female illness-related visits were for female-specific problems, including urinary tract infections and sexually transmitted diseases. There were only minor sex differences in the number of services/procedures received, visit disposition, or duty status. Approximately 5% of the female crew became pregnant each quarters.

Given projects of female-specific disorders developed from these data, approximately 100 Navy health care providers were surveyed to provide senior medical department staffing recommendations for salvage ships, oilers, ammunition ships and stores ships. These survey results suggested that all salvage ships and oilers with less than 75 women aboard should be staffed with an independent duty hospital corpsman. A physician's assistant should serve aboard oilers with more than 75 women assigned, all ammunition ships with women assigned, and combat stores ships with less than 150 women aboard. A complete list of recommendations, detailed illness prevalence estimates, and narrative comments from shipboard health care professionals are provided at the end of the report.

- 90-5 Nice, DS & LK Trent
 PREVALENCE OF HYPERTENSION AMONG ACTIVE DUTY NAVY PERSONNEL
 (1990 Center Publication, AD# A223-892)
 Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: The primary purpose of this study was to estimate the prevalence of uncontrolled hypertension in the Navy. Systolic and diastolic blood pressure readings were collected for 10,886 active duty men and women in conjunction with the Navy's current blood pressure screening program. Blood pressure was elevated in 8.9% of the total sample, which is lower than the adjusted rate for the nation at large. Hypertension was more prevalent among enlisted personnel, older individuals, men, and blacks. The relatively low prevalence of hypertension in the Navy may be related to screening policies at accession and/or the Navy's ongoing health and fitness programs, including exercise, weight control, and nutrition. However, with nearly 1 in 10 sailors exhibiting high blood pressure, it is recommended that the Navy continue its efforts toward a comprehensive program for detection and treatment of hypertension.

- 90-8 Hoiberg, A
 **GAINING CONTROL OF OCCUPATIONAL INJURY AND ILLNESS IN THE U.S. NAVY
 CIVILIAN WORK FORCE**
 (1990 Center Publication, AD# A224-792)
 Work Unit No.: NAVSEA Reimbursable

Abstract: This report describes a process, the Navy Occupational Injury and Illness Case Management Process (NAVCAMPRO), that was designed to integrate all phases of managing cases of occupational injury or illness and to institutionalize the control of these cases in order to achieve effective care coordination, case management, and cost containment. In NAVCAMPRO, role specifications are delineated for the following participants: supervisor, case manager, attending physician, occupational health nurse, health clinic liaison, light-duty supervisor, safety officer, physical therapist, security investigator, employees of the Department of Labor-Office of Workers' Compensation Programs, private physicians, representatives of labor organizations, and injured employees. Another important facet of NAVCAMPRO is the development and implementation of training programs as well as an incentive program (CARE). To implement NAVCAMPRO, key participants receive training, the process is instituted at a naval industrial setting, and an evaluation program of the effectiveness of NAVCAMPRO in meeting the aforementioned criteria is initiated.

- 90-11 Kaszas, SL & DS Nice
 AN EVALUATION OF THE NAVY'S HEALTH PROMOTION VIDEOTAPES
 (1990 Center Publication, AD# A224-794)
 Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: This study evaluated the Navy's six health promotion video-tapes in terms of changes in knowledge, self-efficacy, behavioral intentions, and self-report of behavior, (b) to determine the effects of a pre- and post-viewing discussion, and (c) to report subjective viewer ratings for each of the six

videotapes. The purpose of this research was to determine if viewing a video tape could be an effective method to promote healthful, knowledge and behaviors among Navy personnel. A repeated measure, split-plot factorial design was employed to evaluate the six videotapes. A pre- and post-test questionnaire was used to assess change in knowledge, self-efficacy, behavioral intent, and self-report of behavior in 299 active duty Navy personnel from four shore commands and three ships. In addition, a short survey was administered after the viewing of each videotape to obtain viewer ratings and comments. Analyses of the knowledge scores indicated no significant differences between groups (experimental, control) across time (pretest, post-test) for five of the six videotapes. Separate analyses of the self-efficacy measures, behavioral intentions, self-report of behavior, and of the pre- and post-viewing discussion did not reveal any significant results. Additional analyses on high risk subgroups were also reported. Of the 6 videotapes, the viewers rated the back injury prevention videotape highest on all seven of the rating items. These findings suggest that the videotapes alone were not an effective means of promoting healthful knowledge and behaviors among Navy personnel.

90-22 Woodruff, SI, TL Conway, JM Linenger
**AN ASSESSMENT OF PRE- AND POST-FITNESS MEASURES IN TWO REMEDIAL
 CONDITIONING PROGRAMS**
 (1991 Center Publication, AD# A230-365)
 Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: This study was to determine if taking part in a command-organized remedial physical condition program based on the OPNAVINST 6110.1, Basic Exercise Program (BEP) is effective in reducing body fat, improving failure-special performance on the various components of the Physical Readiness Test (PRT), and improving overall physical fitness level. Pre- and post-program PRT results were collected for participants in a submarine base and an air station BEP-based remedial program to assess changes on the following PRT elements: curl-ups and push-up tests, run/walk test, overall classification score, body fat and percent passing the overall PRT. Comparisons over time showed a trend toward improvement in performance on PRT fitness components, overall classification score, and percent of participants passing the overall PRT at the follow-up test. While results showed improvement in PT performance among participants in the remedial programs, a meaningful impact on body fat reduction was not consistently demonstrated.

90-26 Woodruff, SI & TL Conway
IMPACT OF HEALTH AND FITNESS-RELATED BEHAVIOR ON QUALITY OF LIFE
 (1991 Center Publication, AD# A232-811)
 Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: While the relationships between (a) health behavior and health status, and (b) health status and perceived quality of life (QOL) have received some attention, the association between health behaviors and QOL has not been determined. The primary objective of this study was to assess the effects of health behaviors on QOL which are independent of the effects of health status. A sample of approximately 5,000 randomly selected Navy personnel was split into

halves and analyses performed on each to establish the replicability of the findings. Results indicate that health behaviors influence QOL independently of health status.

90-27 Trent, LK

NUTRITION KNOWLEDGE IN THE U.S. NAVY

(1991 Center Publication, AD# A232-085)

Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: The purpose of this report was to provide a baseline assessment of the level of nutrition knowledge in the active duty Navy. Questionnaires containing 40 true/false and several multiple-choice nutrition items were mailed to a representative sample. Usable questionnaires were returned by 2,938 individuals. Mean score on the 40 T/F items was 26.1 correct, or 65%. Nutrition knowledge was greater among older individuals, more highly education individuals, Whites, officers and women. Knowledge was weakest on the Calories & Food Intake and Carbohydrates scales and strongest on the Vitamins & Minerals and Fiber scales. The Navy appeared roughly equivalent to the civilian sector in meeting (or falling short of) selected national nutrition goals for 1990. It was recommended that the current nutrition education program be continued, but that program managers intensify efforts to reach low-scoring subgroups, place more emphasis on the role of complex carbohydrates in a healthy diet, provide wide dissemination of guidelines for utilizing nutritional labels on products, and develop a Navy-wide "point-of-choice" education intervention protocol for dining facilities.

90-28 Conway, TL; SL Hurtado & SI Woodruff

TOBACCO USE PROGRAMS AT NAVY COMMANDS: 1990 SURVEY RESULTS

(1991 Center Publication, AD# A232-783)

Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: This study was to provide information regarding the implementation of Navy tobacco use policy and to document the extent to which tobacco use programs and activities are being conducted at Navy commands. This information should help Navy health promotion policy makers develop more standardized and effective tobacco use prevention and cessation programs for Navy-wide dissemination. Commands were surveyed about the tobacco use programs and activities they had conducted during the preceding year. A representative sample of Navy commands as well as all medical treatment facilities were targeted. Questions in the survey were oriented primarily toward gathering information about the prevalence and types of programs and activities being conducted. A separate section regarding physicians' tobacco-related practices with patients was included in the surveys to medical treatment facilities. The vast majority of Navy commands provided some type of educational materials or programs related to the cessation of tobacco use; the most common activities were placing announcements in the "plan of the week," circulating flyers, and displaying posters. However, these activities were typically rated as only "somewhat useful" in helping to curb tobacco use.

Only half of all commands offered some type of psychological or behavioral tobacco use cessation program. As a result, it was estimated that those

individuals who attended the cessation program, approximately one-third stopped their tobacco use and about one-half reduced their tobacco use. Over-the-counter smoking cessation aids were not widely available at Navy exchanges, individual commands, or medical treatment facilities. About 60% of all commands reported they had a written policy regarding tobacco use modeled after SECNAVINST 5100.13A.

Findings from this survey suggest three primary recommendations for reducing the prevalence of tobacco use among Navy personnel:

- (1) all Navy command should take a more active role in motivating tobacco users to make serious quit attempts; additionally all commands should be required to have a written instruction delineating the Navy's and the command's policies regarding tobacco use;
- (2) special efforts should be directed toward sea commands (especially surface ships) to reduce tobacco use, as they currently have higher rates of tobacco use but fewer prevention/cessation programs, and
- (3) standardize guidelines for Navy health care providers to help patients stop using tobacco should be prepared and disseminated Navy-wide. Furthermore a standardized, routine system for identifying tobacco users simply by glancing at a patient's records should be adopted by all medical treatment facilities.

90-43 Conway, TL & TA Cronan
 SMOKING, EXERCISE AND PHYSICAL FITNESS
 (1991 Center Publication, AD# A234-658)
 Work Unit No.: (63706N) M0095.005- & NMPC Reimbursable

Abstract: Research on smoking and physical activity provides strong evidence of smoking's negative impact and physical activity's positive impact on long-term health. However, evidence is lacking on the association between smoking and spontaneous exercise activity and the independent effects of these factors on physical fitness. The present study examined these factors in 3,045 Navy personnel. Smoking was clearly associated with lower exercise levels and lower physical endurance (cardiorespiratory and muscular) even after controlling for exercise. Smoking was not related to overall body strength (lean body mass) nor percent body fat after controlling for exercise. These findings suggest that both the direct and indirect links among smoking, exercise, and physical fitness should be explored in models examining health.

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BEHAVIORAL PSYCHOBIOLOGY DEPARTMENT (50)

Tamsin Lisa Kelly, M.D.

Program Manager: Robert Pozos, Ph.D.

a. Department Mission and research program descriptions.

This Department conducts research on psychological and physiological, aspects of health, physical readiness, and emotional fitness of Navy and Marine Corps personnel. The goals are to quantify physiological and performance effects of occupational/environmental conditions, pharmacological agents and certain clinical entities. The Department's research investigates both exogenous and endogenous factors which affect human performance, health and military effectiveness. Sleep and sleep deprivation effects are studied in an effort to promote health and maximize performance in Navy and Marine Corps operations. Areas of investigation include, but are not limited to: pharmacological agents as specific interventions for mission relevant factors, such as sleep deprivation; operational impact of pharmacological agents given for medical reasons; the psychophysiological effects of atypical work environments; ways of optimizing work/rest cycles within operational situations; and the effects of disorders of arousal and sleep on personnel effectiveness.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

Personnel: Dr. Kelly was appointed Department Head on 15 May 1990 relieving Dr. Paul Naitoh, who was appointed Chief Scientist for Sleep Research. Dr. Timothy Elsmore of the Walter Reed Army Institute of Research reported onboard 4 September 1990 to spend two years working in this laboratory. He will be involved with the pharmacological projects and will apply his extensive background in performance assessment software to develop new types of performance tasks to be used by this laboratory and other departments within NHRC. His Army funding is to study and evaluate a new type of Actigraph. Joseph Assmus, an employee under the GeoCenter contract, completes his Masters Degree in the near future at which time consideration will be to hire him as a permanent employee. His background in psychology, statistics, and computer programming make him a valuable addition to the department's staff.

The Desert Shield/Storm event caused a re-focusing on efforts. A report based on sleep log data collected in the Gulf was completed. Collection of more extensive sleep logs is planned to facilitate correct application of sleep logistics principals to the Desert Shield type of environment.

(2) Major accomplishments

In his role as Chief Scientist for Sleep Research, Dr. Paul Naitoh has instituted the technique of Complex demodulation time series analysis in the laboratory. This intricate statistical technique is extremely valuable for separating out the effects of circadian and other rhythms from the effects of

experimental factors being evaluated. Such techniques are of particular utility in the prolonged repeated measure type of study that this department specializes in.

(3) Impact on Navy and Marine Corps mission.

The complete analysis on the methylphenidate/pemoline study indicates that pemoline may prove to be a valuable stimulant drug for use under certain operational conditions. A follow-up study is to commence shortly.

Preliminary findings in the sleep and sleepiness in HIV positive Navy personnel study indicate that sleep disturbance and increased daytime sleepiness are present in this population.

(4) Technology transfer items of Interest. None

c. Work Units

61153N MRO41.01.03-6003 [DN246547], Effects of Psychopharmacological Agents on Performance (Naitoh, PI)

Progress: The visual evoked potentials for CNV analysis are now included in the protocol. The salivary assays on the first half of the subjects is completed. Data collection continues and is expected to be completed this year. Preliminary results suggest that caffeine is having beneficial effects on both speed and accuracy of performance. The salivary assays are providing an excellent picture of both drug levels and of the circadian rhythm of cortisol.

To keep the pilot study on the effects of cold water diving on beta-endorphins at a minimum cost, it was piggy-backed onto a 62 Special Warfare research study which was eventually phased out. Arrangements have been made to perform the necessary data collection during another 6.2 level Special Warfare research study. The first data collection is scheduled to begin in April.

62233N MM33P30.02-6005 Biomedical Enhancement of Mission Performance of Special Warfare Personnel (Goforth, PI)

Study 7: The Use of Stimulants during Sustained Operations (Kelly, PI)

Progress: The first phase of the study has been completed. IBM PCs have been obtained and software developed to run the next phase on the new machines. The medications for the second phase are prepared and randomized, and the study will start as soon as a subject source is determined (BUDS students will not be used for this phase)

63706N MO096.02-6002 [DN248545], Naval Forces Cognitive and Physical Performance Enhancement during Sustained Operations (Banta, PI)

Subproject 2: Ultra-short sleep Logistics (Naitoh, PI)

Progress: The 20-minute Nap Study under this work unit, was completed. Findings include improved accuracy but somewhat slower performance in

napped subjects, especially during the second circadian trough of the continuous work period. Sleep efficiency during the nap periods averaged 71%. There was evidence in the 20-minute nap subjects, and particularly in some pilot 5-minute nap subjects, of psychological stress resulting from the naps, possible related to prolonged sleep inertia. Therefore the possible need for training in the use of naps is raised. A book chapter and a technical report have been published which include part of the data from this study.

A technical report has been written on the analysis performed on some preliminary sleep log data collected from personnel serving in the Gulf area. In progress is a data collection on a more complete and extensive sleep log survey in the Gulf.

ARMY REIMBURSABLE. A Cross-sectional and Longitudinal Polygraphic Sleep Study of HIV seropositive Patients (Naitoh, PI)

Progress: Sleep, sleepiness and performance data have been collected on seven patients. Increased daytime sleepiness and abnormal nighttime sleep have been documented in these subjects. The system for computer recording and spectral analysis of nighttime sleep has been developed.

d. Reports for 1990 include:

- 90-17 Naitoh, P; TL Kelly & H Babkoff
NAPPING, STIMULANT, AND FOUR CHOICE PERFORMANCE
In R Broughton & R Ogilvie (Eds.), Sleep, Arousal and Performance: Problems and Promises. Cambridge, MA: Birkhauser.
(Center Publication, AD# A230-306)
Work Unit Nos.: (6113N) M0096.02-6002 & (62233N) MM33P30.02-6005

Abstract: the 20-min naps (taken every 6 hours) and pemoline (37.5mg administered every 12 hours) are effective in maintaining cognitive and psychomotor functions (necessary to perform the Four Choice serial reaction time task) for a 64-hour continuous period. Previously published reports using a more extensive performance assessment battery on the effects of naps and pemoline on performance maintenance indicate, however, that further studies are necessary before the use of naps and pemoline are recommended in extended field missions.

- 90-25 Kelly, TL & R Booth
A KEYBOARD FOR UNDERWATER PERFORMANCE ASSESSMENT BATTERY TESTING
(1991 Center Publication, AD# A236-579)
Work Unit No.: (62233N) MM33P30.02-6005

Abstract: A waterproof keyboard has been developed. This allows collection of cognitive performance data from divers submerged in a tank. Cognitive tasks are presented to the divers on a computer screen placed at the tank viewing window. The four button keyboard can be easily manipulated while wearing standard diving gloves. Software techniques for adapting various type of tasks to the four-button response format are discussed.

- 90-29 Naitoh, P; GR Banta, T Kelly, J Bower & R Burr
SLEEP LOGS: MEASUREMENT OF INDIVIDUAL AND OPERATIONAL EFFICIENCY
(1991 Center Publication, AD# A239-775)
Work Unit No.: (61153N) M0096.02-6002

Abstract: Two to four days of sleep data was collected from 39 Navy and Marine Corps personnel during an at-sea naval operation in the Persian Gulf. Four the overall group, the average sleep episode duration was 6.8 hours per 24-hours without serious sleep fragmentation. However, analysis of individual crew members showed some with significant fragmentation, particularly among boiler technicians. These individuals could be accumulating a sleep debt which might interfere with sustained attention and situation awareness. Various techniques for analysis of sleep log data are discussed. Advantages and disadvantages as compared to other methods of collecting sleep data are reviewed. The need for larger, more prolonged, studies is emphasized.

- 90-41 Matteson, LT; TL Kelly, H Babkoff, S Hauser & P Naitoh
METHYPHENIDATE AND PEMOLINE: EFFECTS OF SLEEPINESS AND MOOD DURING SLEEP DEPRIVATION
(1991 Center Publication, AD# A234-659)
Work Unit No.: (62233N) MM33P30.02-6005

Abstract: Thirty-six male subjects participated in a study of the effects of methylphenidate or pemoline in maintaining alertness during 64 hours of sleep deprivation. Subjective sleepiness was measured by a visual analog scale, objective sleepiness by the number of lapses on a 10 minutes tapping task, and mood by the Profile of Mood States. Results indicate that 37.5 mg pemoline administered every 12 hours significantly reduced both subjective and objective sleepiness in sleep deprived subjects, primarily during the circadian trough periods which occur during the early morning and early afternoon hours but has little effect on self ratings of mood; while 10 m of methylphenidate administered every 6 hours has no significant effects on these measures.

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Epidemiology Department (Code 60)

Frank C. Garland, Ph.D.

Program Manager: D. Stephen Nice, Ph.D.

a. Department Mission and Research Program Descriptions.

This department conducts epidemiologic research of infectious and chronic diseases using large-scale computerized career history and hospitalization files and maintains the Navy's HIV Central Registry. The HIV Central Registry contains several major data files including: all HIV seropositive personnel identified during clinic visits and from Navy-wide screening; clinical information from evaluations of HIV seropositive personnel; results of western blot assays; and results of ELISA tests. These files are used in conjunction with NHRC Career History Files and Inpatient Files to conduct epidemiologic studies. The department studies morbidity, disability, and mortality in active duty personnel.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

No changes major changes in departmental mission or resources during the reporting period.

(2) Major accomplishments

The Department has two major research areas, the Occupational Studies Program and the HIV Central Registry. The department has added several new sources of information to the HIV Central Registry which have widened the department's ability to conduct epidemiologic studies. Ship deployment information obtained from the Chief of Naval Operations has been integrated into the Career History File maintained at NHRC. Using this resource and career history information concerning duty station assignments, the department has conducted an epidemiologic study of risk of HIV infection according to foreign ports visited by active duty enlisted personnel.

Detailed HIV Western blot test results were added to the HIV Central Registry, allowing future studies of long-term outcomes associated with a variety of testing results.

Occupational studies have been conducted in the Navy by combining Navy occupations having possible common exposures. For example, the rate of melanoma in primarily outdoor occupations was compared with that of personnel in primarily indoor occupations. Personnel in outdoor occupations had equal or lower risk of melanoma than those in indoor occupations. While this finding may seem contrary to expectation, it is consistent with other populations which have been studied for the occurrence of melanoma. This type of grouping of occupations can be used in future studies.

(2) Major accomplishments cont.

In support of Desert Shield and Desert Storm, the Department provided HIV testing data to the Naval Manpower Personnel Command and the Naval Personnel Reserve Command. This information was crucial to deployment of troops, as it is Navy policy that no individuals can be assigned outside the Continental United States unless they have an HIV test on file which was given within the past six months.

A data system for the collection of information regarding injuries occurring during basic training was also developed in the department and added to department data resources. A data collection procedure was designed and brought on-line at two recruit training centers and information on the types of injuries sustained during recruit training was obtained and analyzed.

The department coordinated the San Diego Epidemiology research Exchange, the primary forum for interaction among the San Diego community of epidemiologists. This program was cosponsored by the School of Medicine, University of California at San Diego; the Graduate School of Public Health, San Diego State University, and the San Diego County department of Health Services.

(3) Impact on Navy and Marine Corps mission.

The research in the department has had several impacts on the Navy and Marine Corps mission. The most notable is the information provided by the department concerning HIV testing in support of deployment of troops for operations Desert Shield and Desert Storm. It is the policy of the armed forces that all personnel deployed outside the United States have a negative ELISA test for the presence of antibodies to HIV within the past year. The department provided HIV testing results to the Navy commands responsible for deployment of troops for these major operations.

(4) Technology transfer items of Interest. None.

c. Work Units

- 1) BUMED Reimbursable, "Navy HIV Surveillance and Clinical Evaluation Study (Garland, PI)
- 2) ARMY Reimbursable, "HIV Surveillance in Foreign Ports in Active Duty Navy and Marine Corps Personnel (Garland, PI)

d. Reports for 1990 include:

90-3 Garland, FC; ED Gorham, MR Miller, TM Hickey & LL Balazs
 CROSS-SECTIONAL DEMOGRAPHIC CHARACTERISTICS OF HUMAN IMMUNODEFICIENCY
 VIRUS SEROPOSITIVE NAVY AND MARINE CORPS ACTIVE DUTY PERSONNEL
 (1990 Center Publication, AD# A224-671)
 Work Unit No. MEDCOM Reimbursable

Abstract: This report describes the demographic characteristics of HIV seropositive Navy and Marine Corps personnel on active duty on 31 December 89. There were 1,200 seropositive Navy and Marine Corps Personnel. Officers had lower

prevalence rates than enlisted personnel. HIV seroprevalence rates were higher in men, compared women. Personnel aged 25 to 29 had the highest prevalence rates. The prevalence rate in blacks (3.44) was approximately three times higher than in whites (1.11) or other (1.25) races. Persons with more than 12 years of education had slightly higher rates than those with 12 or fewer years of education. An increasing trend in prevalence rates was seen with increasing length of service. Although the demographic patterns were similar for the Navy and the Marine Corps, Marine Corps rates were lower in all demographic categories.

90-40 Garland, FC; E Gorham, S Cunnion, M Miller & L Balazs
 TRENDS AND METHODS IN IDENTIFICATION OF HUMAN IMMUNODEFICIENCY VIRUS
 (HIV) SEROPOSITIVE PERSONNEL IN ACTIVE-DUTY U.S. NAVY ENLISTED
 PERSONNEL: 1986-1989
 Work Unit No. MEDCOM Reimbursable

Abstract: Time-trends in the occurrence of HIV seropositivity are the basis for projecting the future course of the epidemic. This study presents quarterly rates of HIV infection during 1986 to 1989 in U.S. Navy active-duty enlisted personnel, a large, serially-tested population.

90-6 Linenger, JM; CV Chesson, & DS Nice
 PHYSICAL FITNESS GAINS FOLLOWING SIMPLE ENVIRONMENTAL CHANGE
 (1990 Center Publication, AD# A223-781)
 Work Unit No. (62233N) MM33P30.02-6005

Abstract: Inactivity is the risk factor with potentially the greatest public health impact according to the 1989 U.S. Preventive Services Task Force report. This study reports changes in the physical fitness level following simple changes aimed at enabling community members to more easily adapt active life-styles.

A cohort of active duty personnel from a Naval Air Station at San Diego were administered both a physical readiness test (PRT) and a lifestyle questionnaire at baseline and at one year. The PRT consisted of a 1.5-mile timed run, sit-ups, push-ups, and percent body fat components while the questionnaire addressed demographics, current exercise behavior, and attitudes toward exercise. Similar measures were taken within a comparison community cohort and within a Navy-wide sample cohort. This simple program was successful in improving fitness performance. The improvement was distributed throughout the community and included those who were substandard at baseline. Similar programs could easily be adopted in a variety of communities.

90-24 Linenger, JM & LA West
 EPIDEMIOLOGY OF SOFT-TISSUE/MUSCULOSKELETAL INJURY AMONG U.S. MARINE
 RECRUITS UNDERGOING BASIC TRAINING
 Work Unit No. (62233N) MM33P30.02-6005

Abstract: Soft-tissue/musculoskeletal injuries among military recruits degrade training, cause substantial morbidity, and often contribute to recruit

attrition. Between January and April 1990, we determined incidence of soft-tissue/musculoskeletal injuring occurring during 242,288 recruit days among U.S. Marine Corps recruits undergoing basic training at Marine Corps Recruit Depot, San Diego, California. Computerized outpatient records of all recruits presenting to the dispensary were searched for ICD-9 codes relating to initial visit for injuries. Recruit-days were calculated from weekly strength figures. Utilization proportions and incidence of injury by type and by anatomical location were calculated.

Of the 5,961 dispensary visits by recruits, 27.6% were referred to sports medicine, 22.5% to podiatry, and 49.9% to general practice. The lower limb (including the foot) was involved in 86% of all injuries. Within the sports medicine subclinic the knee (50%) was the most frequent anatomical site for injury, while the most frequent specific injuries were the iliotibial band syndrome (22.2%), patellar tendinitis (15%), and mechanical low back pain (11.4%). The rates of these specific injuries per thousand recruit days were 0.83, 0.65, and 0.39 respectively.

Training-related initial injuries occurred at a rate of 6.6 per 1,000 recruit days and represent significant clinical morbidity in this population. Quantifying the extent of the problem, identifying predisposing factors, training clinicians to properly diagnose and treat injuries, and testing treatment protocols may help to reduce morbidity.

90-37 Linenger, JM & CP Christensen
ILIOTIBIAL BAND SYNDROME (ITBS) AMONG U.S. MARINE RECRUITS UNDERGOING BASIC TRAINING
 Work Unit No. (62233N) MM33P30.02-6005

Abstract: Iliotibial band syndrome (ITBS) is an overuse injury resulting from irritation of the iliotibial band at the point where it crosses the lateral femoral epicondyle. ITBS, often under-diagnosed, occurs most commonly in long distance runners. Among military recruits it degrades training, causes substantial morbidity, and often contributes to attrition. We determined the incidence of ITBS occurring during 242,288 recruit-days among U.S. Marine recruits undergoing basic training at Marine Corps Recruit Depot (MCRD), San Diego, CA between January and April 1990. Cases were identified by searching computerized outpatient entries recorded on all recruits presenting to the dispensary. Recruit-days at risk were calculated from weekly strength figures.

Training-related initial injuries occurred at a rate of 6.6 per 1,000 recruit-days and represented significant clinical morbidity in this population. Iliotibial band syndrome was the most frequently diagnosed condition in the Sports Medicine Clinic and accounted for 22.2% of initial presentations, followed by patellar tendinitis (15.0%) and mechanical low back pain (11.4%). ITBS occurred at a rate of .83 per 1,000 recruit-days. Future efforts should be aimed at further quantifying the extent of ITBS, identifying its predisposing factors, training clinicians to properly diagnose and treat the condition, testing treatment protocols, and intervening to prevent occurrence in order to decrease morbidity and attrition. An overview of the current state of clinical diagnosis and management of ITBS is presented.

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COGNITIVE PSYCHOPHYSIOLOGY DEPARTMENT (70)

David Kobus, LCDR MSC USN

Program Manager: Robert Pozos, Ph.D.

a. Department Mission and Research Program Descriptions.

The Cognitive Psychophysiology Department investigates cognitive performance of Navy and Marine Corps personnel utilizing behavioral as well as psychophysiological techniques such as electroencephalography (EEG), magnetoencephalography (MEG), event-related potentials (ERP), and steady-state responses (SSR). The primary goal of the department is to explore various basic experimental protocols used in cognitive psychology and to extend or apply their use to help develop operational guidelines which will optimize human performance. Research is conducted concerning mental workload, allocation of attentional resources, multimodal information processing, ambient illumination (Low Level White Lighting), and man/machine interfacing. In addition, studies are conducted which monitor various changes in human cognition during sustained or continuous operations under various environment stressors (i.e., heat, cold, noise, etc.).

b. Significant accomplishments (reporting period: Jan-Dec 90)

(1) Changes in departmental mission, functions, and resources.

* As of 31 January 1990, the Cognitive Psychophysiology Division of Code 30 became its own department as Code 70. The number of personnel were increased from five researchers, and two technicians to eight researchers, a computer programmer, a statistician, three technicians, and one technical writer.

* Collaborative research efforts were organized in the study of attention deficits in AIDS patients with several researchers from the University of California at San Diego, Scripps Clinic & Research Foundation, Biomagnetic Technologies Inc. Audiologists and acoustical consultants from Children's Hospital Speech, Hearing, and Neurosensory Center in San Diego designed the Shipboard Habitability laboratory and recommended audiometric and sound-delivery equipment needed for the project.

(2) Major accomplishments

* Trained submarine support personnel in the manufacturing and implementation of Low Level White Lighting (LLW). All U.S. submarines were installed with LLW filters in operational areas (Feb, 1990).

(3) Impact on Navy and Marine Corps mission.

* Low Level White Lighting (LLWL) -- using several layers of "smokey gray" filters around light fixtures to reduce the luminosity levels for night time vision yet preserve the ability to see color. LLWL has been implemented on all SSN and SSBN submarines in the Atlantic and Pacific fleet.

(3) Impact on Navy and Marine Corps mission cont.

* Tactical Decision-Making Under Stress (TADMUS) -- a survey of the numerous stressors in the combat information center in Aegis cruisers.

* Biopsychometrics -- using changes in brain activity to monitor real time changes in vigilance and performance. Computerized neural network model was being developed as a real time "template" of vigilance. This model would be used as a way to determine lapses in vigilance and performance which can be used to feedback an alarm to the operator to regain a state of alertness.

(4) Technology transfer items of Interest. None

c. Work Units

NPRDC/ONT Reimbursable, "Biopsychometric Assessment of Performance"
(Kobus, PI)

Army Reimbursable, "Assessment of Cognitive Performance in HIV+
Personnel: A Psychophysiological Approach" (Linnville, PI)

61152N MR00001.01-6042 [DN240535], "Evaluation of Cognitive Performance
Following Substance Abuse" (Kobus, PI)

61152N MR0000.01-6043 [DN240533], "Steady-state Response and Attentional
Disorders" (Makeig, PI)

ONR Reimbursable, "Bimodal Information Processing in SONAR." (Kobus, PI)

62233N MM33P30-001-6101, "Sustained Operations: Special Topics"
Subproject 1, Electrophysiological Correlates of Cognitive Performance
during Changes in Gravitational Force" (Linnville, PI)

NTSC-ONR Reimbursable, "Tactical Decision Making under Stress (TADMUS)"
(Kobus, PI)

Low Level White Lighting - (Kobus, PI)

NAVSEA Reimbursable, "Shipboard Habitability During Low Frequency Active
(LFA) Sonar Operations" (Coyne, PI)

Reports for 1990 include:

90-15 Kobus, DA & LJ Lewandowski
REPORTED MODALITY PREFERENCES OF SONAR OPERATORS
Work Unit No.: ONR Reimbursable

Abstract: A survey was given to 144 sonar operators (78 submarines (STS) and 66 surface (STG)) which questioned their areas of preferred work schedule, general modality preference, and modality preference for sonar operation. A

majority of subjects reported being most alert and efficient between 0800 and noon. STS operators had a strong preference for a 6 on/12 off work schedule. Responses to general modality questions indicated a preference for the visual modality, which was similar in proportion for both STS and STG groups. On questions pertinent to sonar operation, most operators indicated a visual preference. However on two of these items, proportionally more STS and STG operators showed an auditory preference. Interestingly, 99% of all the subjects reported that present sonar systems are biased toward visual information. Yet, this survey showed that only 57% of the sonar operators rely on or feel they are better at utilizing visual information. The implications of individual operator differences and modality preferences as they relate to sonar task performance are discussed.

90-38 **Merrill, LL; DA Kobus, & JA Rogale**
 AN EVENT-RELATED POTENTIAL EVALUATION OF THE COGNITIVE PERFORMANCE OF
 U.S. NAVY ALCOHOLICS
 (1991 Center Publication)
 Work Unit No. (61152N) MR00001.01-6042 [DN240535]

Abstract: The results of the first of our sessions of a year long longitudinal study of alcoholics are reported. The Event-Related Potentials (ERPs) of two groups (11 alcoholics and 11 nonalcoholics) of subjects were recorded in order to evaluate their utility as objective indicators of cognitive rehabilitation following treatment as a Navy Alcohol Rehabilitation Center (NARC). An additional analysis was done to gauge their usefulness as diagnostic indicators of alcoholism. All of the subjects completed 300 artifact-free trials of a 20/80 auditory "oddball" task. The first session data supports the results of similar studies and therefore the data appears to be reliable and valid. A significant P50 amplitude difference between groups suggests that the alcoholics may have altered sensory gating abilities. The results of a stepwise discriminant analysis of the component parameter values indicated that 100% of the training set subjects (all subjects in both groups) were correctly classified. The equation derived from the training set classification coefficients correctly classified six of six alcoholics in a different sample. The strong discrimination between groups suggests that certain ERP component values (P50, NI-P2, and P300 amplitude) may aid in the identification of alcoholics.

90-39 **Makeig, S**
 PREDICTING LAPSES IN VIGILANCE USING BRAIN EVOKED RESPONSES TO
 IRRELEVANT AUDITORY PROBES
 Work Unit No.: NPRDC/ONT Reimbursable

Abstract: Thirteen subjects participated in an auditory simulation of a passive sonar target detection task. Targets were 300 ms noise bursts presented at near threshold levels in a noise background at a mean rate of 10 per minute. Task-irrelevant probe tones were also presented at inter-stimulus intervals of 2-4 seconds. Each subject participated in two 28-minute test sessions, pressing a button whenever they detected a noise target. Amplitude of the N2 response to the irrelevant probe tones increased monotonically with increase in error rate. Discriminate analysis produced a linear combination of amplitude and latency of

the N2 and P1-N1 evoked response features that reliably discriminated pre-Hit from pre-Lapse responses. In many operational environments, the appearance and moment of onset of task-relevant targets cannot be determined automatically. In these cases, it appears that brain responses to task-irrelevant auditory probes may be used to monitor operator alertness and predict lapses in vigilance.

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STRESS MEDICINE DEPARTMENT (90)

Ross R. Vickers, Jr., Ph.D.
Program Manager: **Robert Pozos, Ph.D.**

a. Department Mission and Research Program Descriptions.

This Department evaluates the health effects of exposure to stressful work settings and demanding environments. Behavioral patterns and endocrinological and immunological mechanisms influenced by exposure to stresses are studied to define stress-relevant processes underlying illness and disease and related performance decrements. Adaptive behaviors, including coping and health behaviors, are investigated as contributors to stress-illness processes to define potential bases for stress remediation programs. Relationships between stress vulnerability and stress effect, including illness and decrements in performance effectiveness, are studied to provide a basis for cost effectiveness evaluations of stress reduction techniques.

During this reporting period, Departmental work focused on the completion of a major series of studies in psychoimmunology and the development of new lines of research on individual differences in stress reactivity and cognitive performance assessment in field settings.

b. Significant accomplishments (reporting period: Jan-Dec 90)

(1) Changes in departmental mission, functions, and resources.

This Department was established 1 May 1990. January to May 1990 this division was under the Operational Performance Department (Code 10)

Added work on cognitive performance assessment under field testing conditions to provide a wider range of measures of stress effects.

Initiated a program of research on individual differences in stress reactivity to be conducted with Office of Naval Research funding.

(2) Major accomplishments

Completed work on program evaluating effects of psychological factors on immune function in basic training. Investigations of natural killer cell activity and antibody responses to inoculations both indicated that the stress of military basic training can reduce immune function. However, these reductions were not convincing predictors of illness in this setting. Studies of antibodies to herpes simplex virus showed that individual differences in these antibodies is a reliable predictor of severity of illness in basic training.

Collaborated with Drs. Sandra M. Levy, Theresa L. Whiteside, and Ronald Be Herberman of the Pittsburgh Cancer Institute, University of Pittsburgh, School of Medicine. A research project examining the psychological correlates of natural killer cell activity (NKCA), an immunological parameter that is related to resistance to viral infections and cancer in Navy personnel, was completed. The work included completion of the data analysis and preparation of a draft report describing the results of two studies of Navy recruits in which stress,

(2) Major accomplishments cont.

personality, and coping were considered as predictors of NKCA. The studies confirmed (1) that people differ substantially to their typical or average level of NKCA; (2) the analyses indicated that individuals with low NKCA scores tended to be those with high scores on indicators of neuroticism and interpersonal warmth; (3) the stress of the initial exposure to training was associated with a lower than average NKCA value for the typical recruit, and that this deviation from average was greater for introverted individuals than for extroverted individuals; and (4) that low NKCA values predicted the severity of upper respiratory illness in recruits. The explicit identification of stable individual differences as the NKCA component that is related to neuroticism, the identification of interpersonal warmth as a correlate of low NKCA and the demonstration that introversion was related to the magnitude of stress effects on NKCA appear to be novel findings within the field of psychoimmunology. A study of Navy Company Commanders was conducted to replicate and extend the findings obtained in recruits.

Collaboration with Drs. Denis Darko, James Connor, Alfredo Jalowayski and Lee Kronenberg of the San Diego Veterans Administration Hospital/University of California Medical School/Lee Biomolecular Research Inc., of San Diego.

A series of studies examining reactivation of latent infections as a potential indicator of overall effectiveness of the immune system in controlling viral infections was completed. The studies demonstrated that the stress of basic training did not lead to reactivation of latent herpes virus infections. Reactivation was defined as a four-fold or greater rise in antibodies as measured by radioimmunoassay or neutralizing antibody assays. Mean levels of antibodies were unchanged over the course of basic training. Instead recruits entered basic training with varying levels of antibodies to herpes simplex viruses, Type 1 and Type 2, and these initial differences were highly stable over the two-month basic training program. The differences in typical antibody level may provide an index of general resistance to infections, because individuals with higher antibody levels reported more severe respiratory illnesses during training.

(3) Impact on Navy and Marine Corps mission.

Helped evaluate the effectiveness of a medical rehabilitation program for Recruit Training Command, San Diego.

Dr. Vickers was a panelist for an Office of Naval Research symposium to define directions for investigation of cognitive stress effects in Navy personnel.

Dr. Vickers was a consultant to OP-01 regarding the utility of personality measures as potential selection devices to predict reactions to the stresses of being a Navy Company Commander.

(4) Technology transfer items of Interest.

Dr. Vickers was a consultant to a MacArthur Foundation program on successful mid-life change. His contributions focused on the identification and measurement of key personality variables to provide a better understanding of effective mid-life transitions.

An previously developed instrument for assessing health behavior patterns was refined. The results were published and the scales have been made available to researchers at several academic institutions.

c. Work Units

COMPLETION 61153N MR04101.00A-6004 [DN246546] "Evaluation of Risk Factors for Infectious Disease" (Vickers, PI)

d. Reports for 1990 include:

No assigned NHRC technical report numbers.

Vickers, RR, Jr., TL Conway, & LK Hervig (1990). Demonstration of replicable dimensions of health behavior. Preventive Medicine, 19, 377-401.

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SUSTAINED OPERATIONS DEPARTMENT (30)

CDR Guy R. Banta, MSC, USN
(January-June)

Harold Goforth, Jr., Ph.D.
(July-December)

Program Manager: Robert Pozos, Ph.D.

a. Department Mission and research program descriptions.

Investigates the unique demands placed upon Navy and Marine Corps personnel by their operational environments and conducts research on psychological, physiological, and environmental stresses as they relate to human performance and how they impact on biochemical homeostasis. Essential to this work is the identification of the physical, mental, behavioral, and man-machine interface requirements for successful performance during sustained military operations. Included in this research effort is the development of improved performance assessment techniques and counter degradation measures for use during operational/environmental extremes.

b. Significant accomplishments (reporting period: Jan-Dec 1990)

(1) Changes in departmental mission, functions, and resources.

(January-June) In June, the current Department Head was moved to the position of command Acting XO. The major new thrust was into thermal/environmental physiology.

(July-December) Changed research priorities to address critical issues related to desert warfare in a chemical environment (Desert Shield/Storm). Reassigned personnel, equipment, and supplies to form a special research cadre to study Microclimate Cooling: Dr. R Pozos, LT R Hesslink, Dr. A Sucec, Mr. J Heaney, Mr. D. Trone; Hydration/Hyperhydration: LCDR B. Bennett, Dr. Hagan; and thermal monitoring: Dr. R. Pozos, Mr. J. Heaney, & Ms. T. Sopchick.

(2) Major accomplishments

(January-June) During this period, data analysis of Persian Gulf field trips were completed. Results identified marked effect of operational conditions (high heat/sleep loss) on mental fatigue, mood, sleep problems, tension/anxiety, and thermal regulation. Implementation of a passive (ice) microclimate cooling vest was found to significantly alter these responses.

A field assessment of Marine Corps personnel during a 25-mile march wearing chemical defense ensemble and field pack was completed. Analysis of data revealed that although 4-5 lbs average weight loss occurred, a 25-mile march with load is tolerable as long as rest breaks occur every hour, forced hydration occurs, and ambient conditions (temperature) are minimal (approximately 70° F on this study).

(2) Major accomplishments cont.

A laboratory assessment of 5-, 10-, 20- and 60-minute naps following 64 hours of sleep loss was conducted. Results revealed that performance of subjects who were allowed nine 20-minute naps (one every 6 hours) tended to be more accurate on some cognitive tasks than those who remained awake throughout the 64 hours. Naps taken for 5 or 10 minutes were found to be unacceptable. Studies assessing performance following 60-minute naps is currently ongoing.

(July-December) * Formed a special research cadre and initiated studies to determine efficacy of an infrared device to accurately measure tympanic membrane temperature as an approximation of core temperature.

* Initiated research to test the efficacy of four fluid replacement solutions as hydration/hyperhydration interventions in a high heat environment (120° F).

* Initiated a series of studies to select and test the efficacy and feasibility of an ice vest to provide microclimate cooling of Marine Corps personnel walking in a high heat environment.

* Completed documentation of a study using a hyperhydration solution to delay dehydration experienced by Navy SPECWAR divers during prolonged cold water immersion. Results demonstrated, however, that hyperhydration with aqueous glycerol solution appears ineffective in reducing body water loss in divers under stress of prolonged cold water immersion.

* Initiated a new substudy for Navy SPECWAR entitled, "Epidemiology of soft-tissue/Musculoskeletal injuries among U.S. Navy SPECWAR Personnel."

- * Collaborative research was initiated with the following individuals/institutions:
 - Warren Lockette, M.D. and Steve Farrow, M.D., Wayne State University, University of Michigan, and VA Hospital, Allen Park, Michigan
 - Ronald Bulbulian, Ph.D., University of Louisville, Kentucky (summer ASEE)
 - Michael Buono, Ph.D., San Diego State University (summer ASEE)
 - David Arnall, Ph.D., University of Northern Arizona, Flagstaff.
 - Arthur Vailas, Ph.D., Biodynamics Laboratory, University of Wisconsin, Madison
 - Naval Science Advisory Program (NSAP)

(3) Impact on Navy and Marine Corps mission.

(January-June):

* Quantification of heat stress/strain environment of Persian Gulf theater and assessment of prototype microclimate cooling countermeasure (ice vest) for shipboard and helicopter aircrew personnel.

* Quantification/preventive assessment of dehydration during long term water immersion commonly experienced by combat swimmers.

(3) Impact on Navy and Marine Corps mission cont.

(July-December):

* Improved method (tympanic Membrane device) of Monitoring thermal status of Marine Corps personnel while forward deployed in a high heat environment.

* Evaluated off-the-shelf hydration solutions for rapid procurement and issue to Marine Corps and Navy personnel operating in high heat environments.

* Identified previously undocumented habitability issues impacting Navy SPECWAR personnel deployed aboard submarines.

* Established epidemiological database of exercise-related injuries at NAVSPECWARCEN associated with BUD/S training to assist medical officers in identifying high risk activities and developing interventions to reduce medical rollbacks and speed return to duty/training (i.e., save money and personnel)

* Evaluated application of off-the-shelf microclimate cooling apparatus to allow for both Navy and Marine Corps personnel to continue operating in a high heat, chemical environment.

(4) Technology transfer items of Interest.

- (a) References, technical reports/abstracts.
- (b) Interim guidelines for use of passive microclimate cooling use aboard ship and helicopters during operation in high heat environments.
- (c) Sustained/continuous operations without sleep and heavy work load guidance for Marine Infantry.
- (d) Report/recommendation on the utility of short sleep logistics (naps) during sustained/continuous operations.
- (e) Application of hyperhydration technology (glycerol solution) for SPECWAR divers was modified for potential use with Marine Corps personnel involved with Desert Shield/Storm.
- (f) Epidemiology database system for Marine Corps Recruit Depot trainees was transferred to NAVSPECWARCEN for BUD/S trainees.
- (g) Ice vest technology proven effective for high heat shipboard engine room environments was incorporated into studies of Marine Corps personnel in high heat desert environments.

c. Work Units

Current:

62233N MM33P30.02-6005 [DN246548] "Biomedical Enhancement of Mission Performance of Special Forces Personnel" (Goforth, PI)

- Study 1: The Collection of Mission Description Information from Special Warfare Personnel (Dr. Goforth, PI)
- Study 2: Profiling of Special Warfare Personnel (Not a separate study)
- Study 3: Physiology and Performance of SDV Operators during Cold Water Exposure (Goforth, PI)
- Study 4: The Effectiveness of Glycerol Ingestion for Plasma Volume Maintenance during Cold Water Exposure (Goforth, PI)

c. Work Units cont.

Current:

62233N MM33P30.02-6005 [DN246548] "Biomedical Enhancement...cont.

- Study 5: The Development of Physical Training Programs for Special Warfare Personnel (to be hired)
- Study 6: Physical Training and Serum Markers of Changes in Muscle and Connective Tissues (Harper, PI)
- Study 7: The Use of Stimulants during Sustained Operations (Kelly, PI)
- Study 8: Decongestant use during Cold Water Diving (Kelly, PI)

63706N M0096.002-6004 [DN248545], "Naval Forces Cognitive and Physical Performance Enhancement during Sustained Operations" (Banta, PI)

- Subproject 1: Effects of Sustained Operations and High Heat Environments on Mental and Physical Performance
- Subproject 2: Ultra-short Sleep Logistics
- Subproject 3: Attentional Resources and Decisionmaking: At-sea Investigation of Sustained Sonar Performance
- Subproject 4: Effects of Sustained Marine Land-based Operations on Mental and Physical Performance

Completions:

NMRDC/Army Reimbursable 63002A0BG995.BC9, "The Impact of Chemical Defense Measures on Sustained Military Operations" (Englund, PI)

Study: MicroSAINT Modeling of Individual and Team Sonar Performance during Shipboard Operations

NDRI Reimbursable, "The Effects of Continuous Work while Wearing the NB Mark II Helmet with SBF Mark 72 Shield" (Heaney, PI)

d. Reports for 1990 include:

90-4 Weinger, MB & CE Englund (1990)

ERGONOMIC AND HUMAN FACTORS AFFECTING ANESTHETIC VIGILANCE AND MONITORING PERFORMANCE IN THE OPERATING ROOM ENVIRONMENT

Anesthesiology, 73, 995-1021. (AD# A245-588)

Abstract: Anesthetic mortality remains a socioeconomic problem, and human error is a major contributor to this mortality. Scientists and engineers in aviation, nuclear power, transportation, and other fields are now able to design new equipment and work environments based on sound ergonomic principles and hard empiric data. At present, very few studies have been performed which assess the factors influencing an anesthesiologist's intraoperative vigilance and his/her response to critical events. In this paper, we have reviewed the major ergonomic and human factors affecting vigilance and monitoring performance on complex monitoring tasks. While most of the data are from nonanesthesia settings, they appear to be relevant to anesthesiologists interested in optimizing their work

environment and their individual performance. A number of specific suggestions have been made based on the available data, however, further research is long overdue, and will be crucial to assure optimal performance in the increasingly complex operating room environment of the future.

- 90-19 Farrow, S; A Mers, G Banta, S Steigerwalt, & W Lockette (1990)
EFFECT OF THE α_2 -ADRENERGIC ANTAGONIST YOHIMBINE ON ORTHOSTATIC TOLERANCE
Hypertension, 15(6)Part 2, 877-880 (AD# A235-012)
 Work Unit No. (63706N) M0096.002-6004

Abstract: Study was on the effect of yohimbine, a drug that inhibits presynaptic α_2 -adrenergic receptors and increases the neuronal release of norepinephrine from the central and sympathetic nervous system, on tolerance to cardiovascular stress in 10 untrained, healthy subjects. Using radiolig and binding of tritiated yohimbine to platelets, these subjects were found to have a normal complement of α_2 -adrenergic receptors with normal K^d . Lower body negative pressure was used to test responses to cardiovascular stress in the subjects after they received either placebo or 20 mg yohimbine. Graded lower body negative pressure from 0 to -40 mm Hg significantly decreased systolic blood pressure, increased heart rate betas, decreased forearm blood flow and increased forearm vascular resistance. Yohimbine increased the blood pressure at rest and during lower body negative pressure, but these changes were not significantly different from values recorded from the individuals when they were given placebo. Also found was that yohimbine significantly increased the plasma insulin concentration in these fasted subjects without inducing hypoglycemia. Because this agent increased forearm blood flow, yohimbine might be useful in treating the orthostatic hypotension and ischemic vascular disease that results from the autonomic insufficiency common in patients with diabetes mellitus.

- 90-20 Gray, CG; OG Kilterman & DC Cutler
THE EFFECTS OF A THREE-WEEK ADAPTATION TO A LOW CARBOHYDRATE/HIGH FAT
DIET ON METABOLISM AND COGNITIVE PERFORMANCE
 (1991 Center Publication)
 Work Unit No. (63706N) M0096.02-6002

Abstract: One of the principal metabolic adaptations to endurance training is an increase in the muscle's utilization of fat. This study investigated several components of metabolism during a three-week adaptation to a low (7-9%) carbohydrate/high (73-75%) fat diet in man. Metabolic measurements were taken initially on 10 healthy male volunteers, ages 19-41, who were on a maintenance exercise program while consuming a standard diet (50% carbohydrate/35% fat). These measurements were subsequently repeated after 7-11 and 17-21 days on the LCD. Questionnaires were administered on repeated occasions to evaluate food acceptability and subjective symptoms. The metabolic tests included intravenous glucose tolerance tests (GTT), meal response tests, and glucose/insulin clamps. Blood samples were also taken on several occasions during the STD and LCD periods to assess changes in overnight fasted blood glucose, free fatty acids, triglycerides, insulin, glucagon, cholesterol, cortisol, thyroid hormone, electrolytes, and ketone bodies. The alterations in metabolism demonstrated by this study are very encouraging for the use of the LCD as an adjunct to increasing certain types of exercise endurance, as well as for a potential treatment of several types of metabolic disorders.

- 90-23 Burr, RG; GR Banta, JT Coyne, JA Hodgdon, & CV Chesson
EFFECT OF A PASSIVE COOLING VEST ON TENSION/ANXIETY AND FATIGUE IN A HIGH HEAT AND HIGH HUMIDITY NAVAL ENVIRONMENT
(1991 Center Publication, AD# A234-0657)
Work Unit No. (63706N) M0096.03-6002

Abstract: Crewmembers aboard U.S. Navy ships in the Persian Gulf must work under high heat and high humidity conditions. Exposure to heat has been shown to affect sleep quality, cause tension, anxiety, and fatigue, and to decrease performance capabilities and cognitive operations. Because many ship spaces cannot be air-conditioned, microclimate cooling is necessary. Objectives of this study were to measure sleep problems, health symptoms, tension/anxiety, and fatigue along U.S. Navy Personnel (N=104) deployed in the Persian Gulf. Also, a sub-sample of subjects (N=44) was measured and compared on levels of tension/anxiety and fatigue between watchstanding sessions while wearing and not wearing a cooling ice vest. Crewmembers reported falling asleep when working, trouble falling asleep, not feeling rested after waking up, mental fatigue, heart distress, and muscle fatigue. Sub-sample subjects had an increase in tension/anxiety from pre-watch to post-watch in the without ice vest condition, but decreases tension/anxiety during the watch when an ice vest was worn. The change in fatigue during watchstanding with the ice vest compared to without the ice vest was not statistically significant. The majority (97%) of sub-sample subjects reported that the ice vest was helpful during watchstanding, that it did not interfere with their ability to do their job, and that they would recommend its future use. The results of this study suggest that the availability of a passive microclimate cooling system (ice vest) is beneficial for naval personnel standing watch in high heat/humidity environments.

- 90-30 Banta, GR & D Braun
HEAT STRAIN DURING AT-SEA HELICOPTER OPERATIONS IN A HIGH HEAT ENVIRONMENT AND THE EFFECT OF PASSIVE MICROCLIMATE COOLING
(1991 Center Publication, AD# A242-152)
Work Unit No. (63706N) M0096.02-6002

Abstract: High heat loads due to engine exhaust intake and high ambient temperatures within a helicopter fuselage during flight, specifically hover, have resulted in reported episodes of symptomatic heat strain among aircrew. An in-flight study of 12 helicopter aircrew was conducted to assess: a) fuselage ambient temperature during Navy H-3 helicopter at-sea operations in a high heat environment (Persian Gulf); b) presence or absence of any cardiac strain or excessive physiological heat load; and c) effectiveness of reducing these responses by wearing a protective cooling (ice) vest.

After review of methods and results, the conclusion is that aircrew performing at-sea helicopter operations in an area of high ambient heat are subject to heat loads that may produce heat stress conditions that can result in marked cardiac and thermal regulatory strain. Wearing of a protective cooling vest appears to reduce this threat.

- 90-31 Banta, GR & RG Burr
HEAT STRAIN AND USE OF MICROCLIMATE COOLING TO PROTECT SHIPBOARD ENGINE
ROOM PERSONNEL WORKING IN HIGH HEAT
Work Unit No. (63706N) M0096.02-6002

Abstract: Throughout the years numerous studies have addressed the effects of high heat on human performance in military working environments: aviation, land-based operations, and wearing chemical defense ensemble. Most recently, concerns have been expressed by Fleet Commanders for U.S. Navy personnel conducting shipboard operations in the Persia Gulf. The Navy's presence in the Gulf has involved a variety of ship types; many of them World War II model, steam and diesel powered vessels. Aboard these ships a number of jobs are task exposed to high heat without the benefit of work space cooling. One in particular is the Engine/Fire Room watch stander. During a previous study in the Persian Gulf, shipboard engine room temperatures had been recorded in the range of 32°C to 71°C. Because of operational necessity, workers in this type of environment may also be required to work many hours and repeated shifts during the day. Unlike industry, the Navy's working environment is not always able to be readily changed by appropriate engineering methods such as, provision of air conditions or structural isolation. However, Navy guidelines for watch standing stay times and/or provision of individual protective countermeasures have been implemented to assist maintenance of safety, performance, and health. The most recent countermeasure has been the introduction of a microclimate cooling system (passive ice vest). The passive ice vest, called the Steele Vest, manufactured by Steele Incorporated, is made of cotton canvas, and contains six frozen thermostrips sewn in horizontally thinsulate insulated pockets, three in front and three in back. The vest is recommended to be work over a T-shirt and working shirt to prevent excessive skin chilling and reddening by direct contact.

- 90-32 Farrow, S; GR Banta, S Schallhorn, A Mers, L Cadaret, L Rudstedt & W Lockette
VASOPRESSIN INHIBITS DIURESS INDUCED BY WATER IMMERSION IN MAN
Work Unit No. (62233N) M33P30.02-6005

Abstract: Water immersion is associated with an initial increase in the central blood volume and concentration of plasma atrial natriuretic factor ANF, and this increase in ANF results in a marked natriuresis and diuresis. It is unknown whether vasopressin can inhibit the diuresis and natriuresis resulting from water immersion-induced increases in plasma ANF in humans. We tested the hypothesis that 8-desaminon-D-arginine vasopressin, DDAVP, a V2 receptor agonist, could inhibit the diuresis induced by water immersion. Water and electrolyte excretion, plasma ANF, and plasma aldosterone were measured initially and following three hours of water immersion in 13 healthy, sodium replete men given either placebo or 0.2 ug of intranasal DDAVP. Cyclic guanosine monophosphate and urea excretion and urine osmolality were also determined. DDAVP was shown to inhibit the diuresis induced by water immersion. After three hours of water immersion, plasma ANF concentrations were increased. DDAVP may be used to prevent the diuresis associated with central redistribution of blood volumes that

occur during water immersion or in other extreme environments such as exposure to microgravity. Furthermore, it is suggested from this study that the V2 receptor has a direct effect on the control of sodium excretion.

90-33 Goforth, HW Jr. & DA Arnall

EFFECTIVENESS OF GLYCEROL INGESTION FOR ENHANCED BODY WATER RETENTION DURING COLD WATER IMMERSION

(1991 Center Publication, AD# A234-942)

Work Unit No. (62233N) MM33P30.02-6005

Abstract: The efficacy of ingesting an aqueous glycerol (GLY) solution to reduce diuresis and enhance body water retention during prolonged cold water dives was tested. Six subjects were assigned to either a water treatment or glycerol treatment group. During the pre-dive period, divers drank approximately 2 liters of flavored water solutions with or without GLY. Total urine output did not differ between treatments. The amount of urinary glycerol collected during the hyperhydration period and the three-hour dive periods accounted for 4.1% and 10.3% respectively, of the total GLY ingested. Hyperhydration with GLY appears ineffective in significantly reducing body water loss in divers under the stress of prolonged cold water immersion.

90-34 Goforth, HW Jr.; JA Hodgdon, & N Seidle

SEAL DELIVERY VEHICLE OPERATOR PERFORMANCE MEASUREMENT SYSTEM AND TEST SCENARIOS FOR BIOMEDICAL STUDIES DURING MISSION SIMULATIONS

Work Unit No. (62233N) MM33P30.02-6005

Abstract: This report describes the design and development of a performance measurement system to measure SEAL Delivery Vehicle pilot and navigator task performance during a simulated mission under controlled conditions. The system allows measurement of operator performance during four different but equivalent test scenarios (i.e., 6.5-hour mission simulations). Each scenario contains the same number and type of targets, course changes, equipment malfunctions, etc.; thus, the effect of various controlled conditions such as water temperature, active and passive thermal protection systems, and biomedical interventions on pilot and navigator and task performance can be ascertained with scientific vigor.

90-35 Prusaczyk, WK; HW Goforth Jr., & M Nelson

CHARACTERISTICS OF PHYSICAL TRAINING ACTIVITIES OF U.S. NAVY SPECIAL FORCES TEAM MEMBERS OF NAVAL SPECIAL WARFARE GROUP-ONE, NAB CORONADO

Work Unit No. (62233N) MM33P30.02-6005

Abstract: A detailed physical training activity questionnaire was administered to 102 U.S. Navy Special Warfare Sea Air Land (SEAL) personnel undergoing advanced training. Responses to this questionnaire provided information on the kinds and quantities of aerobic and strength conditioning activities in which they are engaged and the locations in which these activities occurred. These data were used to evaluate the training programs currently in use by the West Coast SEALs.

One hundred and two SEALs completed the questionnaire and their responses used to characterized training activity in relation to the American College of Sports Medicine (ACSM) Guidelines for maintenance of aerobic and strength fitness. Overall, SEALs reported engaging in aerobic activities (running, bicycling and swimming) in frequencies, intensities, and durations appropriate for maintenance of aerobic fitness levels. Strength conditioning also occurred with sufficient frequency and quantity for maintenance of current levels of muscular strength fitness. However, strength training tended to concentrate predominantly o upper body muscles.

Although SEALs participated in aerobic and strength training in quantities sufficient to maintain fitness, the overall volume of training is somewhat less than many other elite or competitive athletes. Further, the quality of the physical training programs varied widely depending on the advanced course/activity in which the SEALs were engaged. With more knowledge of the scientific principles of athletic training, SEALs could enhance their fitness levels. Further, they could use these principles to optimize their training activities so that all team members develop and maintain the high levels of fitness required for successful mission completion.

90-36 Buono, MT; J Heaney, GR Banta, D Dyar, R Bulbulian, & A Sucec
THE RELATIONSHIP BETWEEN VASOACTIVE INTESTINAL POLYPEPTIDE AND WHOLE-BODY SWEAT RATE DURING EXERCISE
(1991 Center Publication)
Work Unit No. (6370N) M0096.002-6002

Abstract: This study examined the relationship between vasoactive intestinal polypeptide (VIP) and sweat rate during exercise. Seven male volunteers performed one hour of exercise at 60% of their maximal oxygen uptake in 15°C, 25°C, and 35°C conditions. Vasoactive intestinal polypeptide whole-body sweat rate, and forearm skin blood flow were measured during each condition. Sweat rate and delta VIP demonstrated a significant linear relationship. Forearm skin blood flow and VIP were also linearly related. These results support the hypothesis that active cutaneous vasodilation and sweat rate are physiologically linked via the co-release of acetylcholine and VIP at the eccrine sweat gland. These findings strongly suggest that VIP plays a role in the human thermoregulatory response to exercise in the heat.

90-42 Burr, RG; SI Woodruff, & GR Banta
ASSOCIATIONS BETWEEN MOOD AND SPECIFIC HEALTH COMPOSITES DURING NAVY PERSIAN GULF OPERATIONS
(1991 Center Publication, AD# A234-656)
Work Unit No. (6370N) M0096.002-6002

Abstract: Previously conducted field studies using shipboard U.S. Navy personnel during at-sea operations in the Persian Gulf have shown that crew members experience mood changes and degradations in general physical health. The

objectives of this study were to: a) extend previous research by using specific health complaints rather than a general measure of health; and b) examine the relationship between mood and specific health complaints among personnel deployed in the Persian Gulf. Questionnaire data were collected from 104 volunteers serving aboard two U.S. Navy ships (AGF and an MSO) deployed in the Gulf. Mood was assessed using the Profile of Mood States Tension/Anxiety and Fatigue scales. Health symptoms were measured using the Environmental Symptoms Questionnaire (ESQ). Results of multiple regression analyses showed that each of the 11 ESQ health composites was significantly associated with one or both mood variables; the two mood states differentially predicted 9 of 11 distinct health composites. This study points to the usefulness of employing multiple health composites rather than global measures when assessing mood-health associations.

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1990 Command History-NHRC

Biography and Photo of Commanding Officer

Encl (2)

Biography of the Commanding Officer

Commander Guy R. Banta, Medical Service Corps, USN, received a B.A. (Biology/ Chemistry) from the University of Evansville, Indiana in 1973; a M.S. (Physiology) from Old Dominion University, Norfolk, Virginia, in 1976, and a Ph.D. (Physiology) from the Uniformed Services University of the Health Sciences, School of Medicine, Bethesda, Maryland, in 1982. After completing five years of active enlisted service as a Naval Hospital Corpsman, he returned to college in 1971 to complete his undergraduate education. Following completion of his degree in 1973, he returned to active duty with a commission in the Medical Service Corps, United States Navy. Both his Masters and Doctorate were completed while on Active Duty. He was designated as a Naval Aerospace Physiologist in 1974 following training at the Naval Aerospace Medical Institute, Pensacola, Florida.



His primary research interest is in Physical and Cognitive Human Performance with special emphasis on cardiovascular, musculoskeletal, psychophysiology, thermodynamic, and endocrine alterations that occur with varied work loads, exercise, physical conditioning, and occupational/environmental stressors. His research interests and experience include extensive background in the area of physiological response in man during flight.

He is a Fellow of the Aerospace Medical Association, a Member of the American College of Sports Medicine, the Aerospace Physiologist Society, the American Physiological Society, the International Society for Chronobiology, and numerous other professional organizations.

His military background includes service on two ships, the Fleet Marine Force in Vietnam, and a number of Naval Regional Medical Centers (Naval Hospitals), Naval Air Stations, and Naval Medical Research and Development Commands. He has completed primary flight training and is parachute jump-qualified. Among a number of awards, he has been awarded the Bronze Star with Combat "V", the Meritorious Service Medal, three Purple Hearts, and the Navy Commendation Medal.

In June of 1988, Dr. Banta reported to the Naval Health Research Center. In November 1990 he was directed to and is currently serving as Commanding Officer of the command.

1990 Command History-NHRC

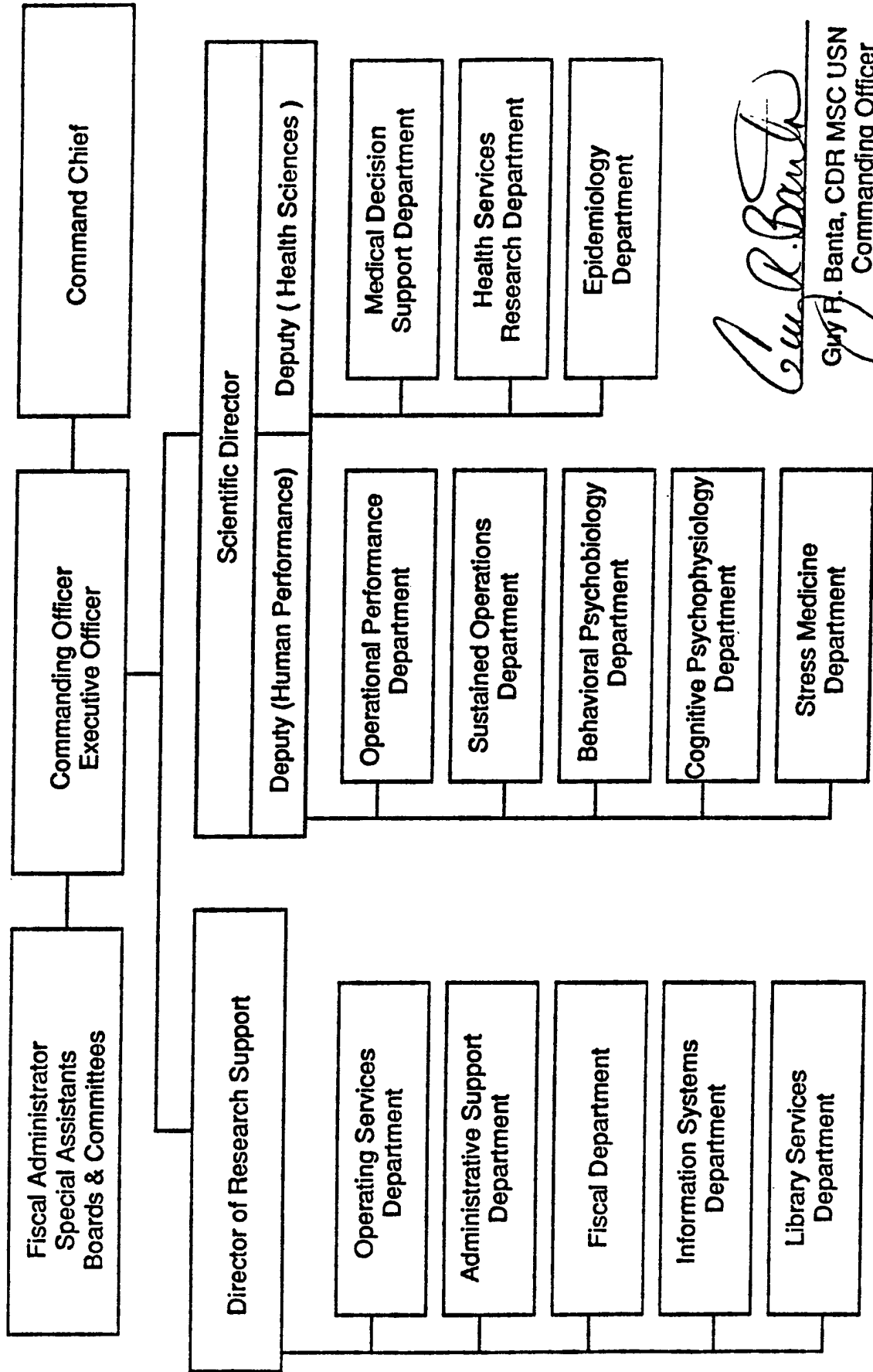
* Organization Chart as of 31 December 1990

* Staff Directory

* Boards, Committees, Collateral Duties

Encl (3)

NAVAL HEALTH RESEARCH CENTER



Guy R. Banta
Guy R. Banta, CDR MSC USN
Commanding Officer
31 December 1990

PERSONNEL DIRECTORY/TELEPHONE LIST FOR
Naval Health Research Center
P. O. Box 85122
San Diego, CA 92186-5122

as of 31 December 1990

OFFICE OF THE COMMANDING OFFICER

Bldg No. 306 (Upper) Commercial (619) 553-ext. (Autovon 553+ext.)
Fax: (619) 553-9389

00	Commanding Officer	:	CDR Guy R. BANTA, MSC/USN	553-8429
00S	Secretary (Steno)	:	Brenda M. CROOKS	3-8428
01	Acting Executive Officer	:	LCDR Glenn R. BAKER, MSC/USN	3-8419
001	Scientific Director	:	Dr. John Silva	3-8421

Bldg 332 (Upper) Commercial (619) 553-ext. (Autovon 553-ext.)
Deputy Directors for

002	Human Performance	:	Robert POZOS, Ph.D.(Temp).....	553-8396
003	Health Sciences	:	D. Stephen NICE, Ph.D.	553-8386
	GEO Contractor/Technical Typist:		Sue SOBANSKI	3-8389

SPECIAL ASSISTANTS

Command Evaluation Ofcr	:	LCDR Brad BENNETT, MSC/USNR	553-8381
Command Chief Petty Officer	:Vacant.....	3-8423
Safety Officer	:	HM1 Jordon MALBROUGH, USN	524-6728
Asst Mgt Control Coord	:	LT Stephen LINNVILLE MSC/USNR	3-8412
Financial Administrator	:	James E. BENNETT	3-8424

DIRECTOR OF RESEARCH SUPPORT

02	Director	:	LCDR Glenn S. BAKER, MSC/USN	553-8419
02S	Clerk-Typist	:	Dawn Armstrong	3-8400

Research Support: Administrative Support Department
Administrative Services : HM2 Tina M. JENKINS, USN 553-8423

Research Support: Fiscal Department
Financial Administrator : James E. BENNETT 553-8424
Financial Administrative Analyst: Joyce TOOHEY 3-8430

Bldg 306 (Lower) Research Support: Library Services Department
Library, Librarian : Mary E. ALDOUS 553-8425
Library Technician : Betty CROFT 3-8426
Library Aid : Bobbie WOFFORD 3-8426

Bldg 346 (Lower) Research Support: Operating Services Department
General Duty : HM2 Davey R. ELLISON, USN 553-8458
Motor Vehicle Operator : Ralph D. GARCIA 3-0462

Bldg 309 Research Support: Information Systems Department
 Supv Computer Specialist : Raymond P. HILBERT 553-8433
 Secretary (Typing) : Christina KAMFONIK 3-8432
 Computer Clerk : Daniel AMARENTO 3-9920
 Computer Programmer Analyst: Richard F. BOOTH 3-8439
 Computer Programmer Analyst: Dwayne A. CASTLEBERRY 3-8440
 Computer Clerk : Prima S. FONTANARES 3-8437
 Electronics Technician : Donald A. IRWIN 3-8435

Bldg 309 Research Support: Civilian Personnel
 Civilian Personnel Assistant: Janie BANKS 553-9347
 Civilian Personnel Asst Trainee: Linda WETTELAND 3-9347
 Student Aid : Rose WRIGHT(Temp)..... 3-9347

DEPARTMENT OF OPERATIONAL PERFORMANCE (CODE 10)

NTC Bldg 272 Commercial (619) 524-ext. (Autovon 524-ext.)

10 Dept Head/Supv Research Physiologist: James A. HODGDON, Ph.D. ... 524-4525
 10A Editorial Assistant (Typing): Marilyn REDDEG 4-4526
 Research Physiologist : Marcie B. BECKETT..... 4-4517
 Computer Systems Analyst : Patricia A. COBEN

 Research Physiologist : LT Robert L. HESSLINK, MSC/USNR.. 524-4520
 General Duty : HM1 Wanda WOODS, USN 4-6726
 General Duty : HM1 Jordan M. MALBROUGH, USN 4-6728

NTC Bldg 280, Physical Rehab

Medical Doctor : LCDR Craig BISCHOFF, MC/USN 524-0743
 General Duty : HM3 Randy HOWIE, USN 4-0743

Bldg 346 (Lower)

Environmental Health Ofcr : LCDR John T. COYNE, MSC/USN 3-8457

DEPARTMENT OF MEDICAL DECISION SUPPORT (CODE 20)

Bldg 331 (Upper) Commercial (619) 553-ext. (Autovon 553-ext.)

20 Dept Head/Supv Research Psychologist: William M. PUGH 553-8403
 20A Editorial Assistant (Typing) : Ednafe JOSAFAT 3-8401
 Computer Systems Programmer : Dianna M. PEARSALL 3-8471
 Computer Systems Analyst : Lawrence A. HERMANSEN 3-8402
 Computer Programmer Analyst : Gerald PANG 3-8409
 Computer Programmer : Hoa LY 3-9289
 Statistician (General) : Eddie SHAW 3-9291
 Statistician (Health) : Martin R. WHITE 3-9292
 Research Psychologist : Walter W. WILCOX 3-8410
 Research Psychologist : David H. RYMAN 3-8408

 General Duty : HM1 Alvin ALAMDA, USN 553-8405

Bldg 332 (Upper)

Research Psychologist : Christopher G. BLOOD 3-8393
 Research Psychologist : Richard RIEMER 3-8391

DEPARTMENT OF SUSTAINED OPERATIONS (CODE 30)

Bldg 332 (Lower) Commercial (619) 553-ext. (Autovon 553-ext.)

30	Dept Hd/Research Psysiologist	:	Harold W. GOFORTH, Jr. Ph.D. ...	3-8379
30A	Editorial Assistant (Typing)	:	Gloria HELD	3-8375
	Clerk-Typist	:	Tracy L. SOPCHICK	3-8377
	Research Physiologist	:	Jay HEANEY(Temp).....	3-8380
	Psychology Technician	:	Danny BRAUN(Temp).....	3-8377
	GEO Contractor/Technical Writer:	:	Cindy BECHTEL-GROAT	3-8374
	Research Physiologist	:	LCDR Brad BENNETT, MSC, USN	3-8381
	Medical Officer (DMO)	:	LCDR Phillip D. HUNT, MSC, USNR..	3-8376
	General Duty	:	HM2 Elvis B. LANSANGAN, USN	3-8384
	General Duty	:	HM3 Elmer LABRANCH, USN	3-8384

Bldg 332 (Upper)

Statistician (General) : Ralph G. BURR 553-9967

Bldg 315

	Research Phychologist	:	Carl E. ENGLUND, Ph.D.	553-8443
	Research Physiologist	:	Anthony SUCEC, Ph.D. ..(Temp)..	3-8444
	Research Psychologist	:	Diane WILLIAMS, Ph.D.	3-8442
	Psychology Technician	:	Valarie LOEWE(Temp)..	3-8447
	VA-DOD Hire	:	Richard T. LOVING, R.N.	3-9387
	GEO Contractor/Scientist	:	Daniel TRONE	3-8445

DEPARTMENT OF HEALTH SERVICES RESEARCH (CODE 40)

Bldg 346 (Upper) Commercial (619) 553-ext. (Autovon 553-ext.)

40	Dept Head/Research Psychologist:	:	Anne L. HOIBERG	553-8463
40A	Editorial Assistant (Typing)	:	Frances JACKSON	3-8470
	Research Psychologist	:	Terry L. CONWAY, Ph.D.	3-8465
	Research Psychologist	:	Susan HILTON	3-8462
	Research Psychologist	:	Suzanne HURTADO	3-8469
	Research Psychologist	:	Linda J. TRENT	3-8464
	Research Psychologist	:	Jack WHITE(Temp).....	3-8461
	Computer Prog. Analyst	:	Susan I. WOODRUFF	3-8466

DEPARTMENT OF BEHAVIORAL PSYCHOBIOLOGY (CODE 50)

Naval Hospital, Bldg 6-4 Commercial (619) 532-ext. (Autovon 522-ext.)
FAX: (619) 532-6168

50	Dept Head/Medical Officer	:	Tamsin KELLY, M.D.	532-6115
50A	Editorial Assistant (Typing):	:	Viola CASTELLI	2-6114
	Research Psychologist	:	Steven A. GOMEZ	2-6172
	Research Psychologist	:	Larry MATTESON(Temp).....	2-6114
	EEG Technician	:	Lorene IRWIN	2-6199
	Medical Officer (Poly-somnographer (Part/time)	:	Roza HAJDUKOVIC, M.D.(Temp)...	2-6114
	EEG Technician	:	Matthew SINCLAIR	2-6171
	GEO Contractor/Scientist	:	Joseph D. ASSMUS	2-6169

Code 50 cont.

Chief Scientist for Sleep Research/
Supv Research Psychologist : Paul NAITOH, Ph.D. 532-6166
General Duty : HM2 Brian W. APPLETON, USN 2-6165

DEPARTMENT OF EPIDEMIOLOGY (CODE 60)

Trailer Bldgs 635 & 636 Seaside Commercial (619) 553-ext. (AV 553-ext.)

60 Dept Head/Supv Statistician : Frank C. GARLAND, Ph.D. 553-6884
60A Editorial Assistant (Typing): M. Joyce JOHNSON 3-6881
Computer Programmer : Louis BALAZS(Temp)..... 3-6887
Statistician (Health) : Edward D. GORHAM 3-6883
Computer Specialist : Milan R. MILLER 3-6892
Computer Programmer : Michael S. McNALLY 3-6884
Consultant for Scientific
Affairs (Part time) : EK Eric Gunderson, Ph.D. ..(Temp).. 3-6897
Medical Ofcr/Epidemiologist : CDR Jerry M. LININGER, MC/USN 3-6896
Bldg 331 (Upper)
General Duty : HM2 Princess M. STOVER, USN 3-8405

DEPARTMENT OF COGNITIVE PSYCHOPHYSIOLOGY (CODE 70)

Bldg 331 (Lower) Commercial (619) 553-ext. (Autovon 553-ext.)

70 Dept Hd/Research Psychologist : LCDR David A. KOBUS, MSC/USN .. 553-8417
GEO Contractor/Technical Writer: Nancy KOBUS 3-0730
Research Psychologist : Lex MERRILL, Ph.D.(Temp).. 3-8418
Research Psychologist : F. Scot ELLIOTT 3-8411
GEO Contractor/Scientist II : Jeff BECK 3-8414
GEO Contractor/Scientist I : Candee CORWIN 3-9388
GEO Contractor/Scientist : Mark INLOW 3-0478
GEO Contractor/Physiologist : Debra YNIGUEZ 3-0730
Bldg 331 (Lower)
Research Psychologist : Scott MAKEIG, Ph.D. 3-8416
Grant (Contract) : Anne MAKEIG 3-8416
Research Psychologist : LT Steven LINNVILLE, MSC/USNR ... 3-8412
EEG Technician : HM3 Les MOROSI, USN 3-9388

Bldg 332 (Upper)
GEO Contractor/Senior Scientist: Dr. Monty HERRON ..(Code 70).... 3-8392

DEPARTMENT OF STRESS MEDICINE (CODE 90)

Bldg 346 (Lower) Commercial (619) 553-ext. (Autovon 553-ext.)

90	Dept Head/Research Psychologist	:	Ross R. VICKERS Jr., Ph.D. ...	553-8454
	Research Psychologist	:	Linda K. HERVIG	3-8455
	Research Psychologist	:	Jeff KUSULAS(Temp)....	3-8450
	GEO Contractor/Scientist	:	Grant MARSHALL, Ph.D.	3-8451

BOARDS, COMMITTEES, COLLATERAL and/or SECONDARY DUTIES

Automatic Data Processing/Information Systems (ADP/IS) Program positions
(OPNAVINST 5239.1A, NHRCINST 5230.4B)

ADP Security Officer	:	R. Booth	553-8439
ADP Security Manager	:	LT Hesslink	524-4520
ADP Office IS Security Ofcr:		D. Castleberry	3-8440
ADP System Security Ofcrs :		L. Hermansen	3-8402
		R. Hilbert	3-8433
		M. Beckett	524-4517
		D. Braun	3-8377
		S. Gomez	532-6172

ADP/IS Systems Manager (SECNAVINST 5211.5C, NHRCINST 5211.1)

Mr. Hilbert 553-8433

Awards Review Committee, Military (NHRCINST 1650.2, SECNAVINST 1650.81E)

Chairman:	LCDR Baker	553-8419
Members :	CDR Linenger	3-6896
	LCDR Kobus	3-8417
	HM1 Woods	3-8423

Biomedical Communications Center Point of Contact (NAVMEDCOMINST 5290.1, NHRCINST 5290.1A)

HM2 Ellison 553-8458

Casualty Assistance Calls Program Officer (NMPCINST 1770.1, NHRCINST 1770.1A)

CDR Banta	553-8429
Alt: LCDR Baker	3-8419

Civilian Employee Development Committee (NHRCNOTICE 12410)

Chairman:	LCDR Baker	553-8419
Secy/Mem:	J. Banks	3-9347
Members:	M. Aldous	3-8425
	L. Hervig	3-8455

Command Career Counselor (NAVMEDCOMINST 1040.1)

HM1 Woods 553-8423

BOARDS, COMMITTEES... SECONDARY DUTIES

Command Evaluation Officer (NHRCINST 7500.1C, SECNAVINST 7510.8C, NAVMEDCOM-INST 7510.1A)

LCDR Bennett 553-8381

Command Military Awards Coordinator (SECNAVINST 1650, NHRCINST 1650.1)

LCDR Baker 553-8419

Command Property Administrator (NHRCINST 7321.1)

LCDR Baker 553-8419
Asst: HM2 Ellison 553-8458

Commercial Activities Program Manager (OPNAVINST 4860.7B)

LCDR Baker 553-8419

Committee for the Protection of Human Subjects (SECNAVINST 3900.39B, BUMEDINST 3900.6, NHRCINST 3900.1C)

Chairperson -	Dr. Nice	553-8386
Chaplain:	LCDR Walter N. Leverette CHC USN	532-6025
Legal:	LCDR Debra R. White, JAGC USNR	556-7266
Medical:	CDR Linenger	3-6896
Mil Rep:	LCDR Kobus	3-8417
Members:	LT Hesslink	524-4520
	Dr. Kelly	532-6115
	C. Blood	3-8393
Alt Member:	Dr. Williams	3-8447
Alt Medical:	LCDR Hunt	3-8376

Contracting Officer Technical Representatives (NAVSUPINST 4330.6A)

William Pugh 553-8403
Christopher Blood 3-8393
LCDR Baker 3-8419
Larry Hermansen 3-8402

Credentialing Program (NHRCINST 6320.1)

Coordinator: LCDR Bischoff 524-0743

Drug and Alcohol Program Advisor (DAPA)

HM2 Appleton 532-6165

BOARDS, COMMITTEES... SECONDARY DUTIES

Energy Conservation Panel (OPNAVINST 4100.8A, NAVFACINST 4100.8, BUMEDINST 4100.2, NHRCINST 4100.1B)

Chairman:	LCDR Hunt	553-8376
Members:	Dr. Englund	3-8443
	HM3 Labbranch	3-8384

Energy Officer (BUMEDINST 4100.2A, NOSCINST 4100.3, NHRCINST 4100.1B)

HM3 Labbranch	553-8384
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Enlisted Advisory Program (NAVMEDCOMINST 5390.1, NHRCINST 5390.1)

Advisor:	HM1 Woods	553-8423
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Enlisted Training Petty Officer (NHRCINST 1510.1)

HM1 Woods	553-8423
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Equal Employment Opportunity (EEO) Representative (SECNAVINST 5350.10A, NAVMEDCOMSWREG INST 12713.2, NHRCINST 12713.1)

Mr. Shaw	553-9291
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Equal Opportunity Program (OPNAVINST 5354.1B, NAVMEDCOM 5354.4, NMRDCINST 5454.1A, NHRC 5354.1A)

LT Linnville	553-8412
Asst: HM3 Morosi	3-0478

Family Advocacy Program (OPNAVINST 1752.2)

Representative: Anne Hoiberg	553-8463
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Forms Management Officer (SECNAVINST 5213.10C)

HM1 Woods	553-8423
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Hazardous Material Control Program Manager (NHRCINST 5100.1A, NAVSUPINST 5100.27)

Manager:	LCDR Coyne	553-8457
Officer:	HM1 Malbrough	524-6728
Asst :	HM2 Ellison	553-8458

BOARDS, COMMITTEES... SECONDARY DUTIES

Host/Tenant Liaison Officer (NAVCOMPT MAN VOL VII, CH5, NAVMEDCOMINST 7050.1)

LCDR Baker 553-8419

Incentive Awards Board (NHRCINST 12451.1)

Members:	LCDR Baker	553-8419
	Ms. Banks	3-9347
	Mr. Bennett	3-8424
	Mr. Garcia	3-0462
	Ms. Hoiberg	3-8463

Informal Survey Officer (NAVSUPMAN VOL II)

LCDR Baker 553-8419
<Board consist of All Commissioned Officers, for extensions see NHRC
Phone Roster>

Information Systems Executive Board (ISEB) (NHRCINST 5230.1A, NHRCINST 5230.5, OPNAVINST 5239.1A)

Membership - Executive Officer	:	LCDR Baker	553-8419
Scientific Director	:	Dr. Silva	3-8421
Research Information:		Mr. Hilbert	3-8433
		Mr. Booth	3-8439
Deputy Sci Dir's	:	Drs. Nice & Pozos	

Information Systems Executive Board (ISEB) Working Group (NHRCINST 5230.1A)

Chairman:	R. Booth	553-8439
Members :	L. Hervig	3-8455
	S. Woodruff	3-8466
	M. McNally	3-6893
	M. Sinclair	532-6171

Laser Safety

System Safety Officer:	LT Hesslink	524-4520
Safety Officer	:	HM1 Malbrough 524-6728
Assistant	:	HM2 Ellison 553-8458

Library Committee (NHRCINST 5070.1)

Chairman:	LCDR Baker	553-8419
	LCDR Bischoff	524-0743
	L. Trent	3-8464
	S. Gomez	532-6172
	Dr. Englund	3-8443
	D. Booth	3-8439

BOARDS, COMMITTEES... SECONDARY DUTIES

Management Controls Officer (SECNAVINST 5200.35B; OPNAVINST 5200.25B, NHRCINST 5200.1)

LCDR Bennett 553-8381
Assistant: LT Linnville 3-8412

Military Cash Award Program (MILCAP) (OPNAVINST 1650.8C)

LT Linnville 553-8412

Morale Welfare and Recreation Committee (Command)

Chairman: LCDR Bennett 553-8381
Secy/Treasurer: J. White 3-8461
Asst: T. Kamfonik 3-8432
Members: Volunteers

Naval Reserve Liaison Officer (Surgeon General ltr to CO of 25 Jan 80)

LCDR Baker 553-8419

NTC Energy Resources Conservation (NAVTRAINST 5420.4D)

HM3 Howie 524-0743

NTC Top Four Club Open Advisory Group (NAVTRAINST 5420.4D)

HM3 Morosi 553-0478

PASS Liaison Rep (Pay/Personnel Administrative Support System) (OPNAVINST 1000.23A)

HM1 Woods 553-8423
Alt: D. Armstrong 3-8400

Photographer (NHRC ltr 5312/00/gjh, Ser 4014, 6 Jul 81)

HM3 Labranch 3-8384
Alt: B. Crooks 3-8428

Physical Fitness Program (OPNAVINST 6110.1C)

Officer: LCDR Bischoff 524-0743
Fitness Coordinator: HM2 Lansangan 553-8384

BOARDS, COMMITTEES... SECONDARY DUTIES

Physical Security Review Committee (PSRC) (NHRCINSTs 5530.1 and 5510.1C)

Chairperson:	LCDR Baker	553-8419
Members:	HM1 Woods	3-8423
	Mr. Bennett	3-8424

Position Management Board (NHRCNOTE 5310, NHRCINST 12510.1)

Chairman:	LCDR Baker	553-8419
Members:	Dr. Silva	3-8421
	Dr. Nice	3-8386
	Dr. Pozos	3-8396
	Mr. Bennett	3-8424
Member/Recorder:	J. Banks	3-9347

Postdoctoral Research Associateship Program (NHRC Ltr 3912/12400/01/bmc, Ser 3888, 22 Dec 80)

Chairman:	Dr. Silva	553-8421
Members :	Dr. Nice	3-8386
	Dr. Pozos	3-8396

Privacy Act Coordinator (SECNAVINST 5211.5C, NHRCINST 5211.1A)

A. Hoiberg	553-8463
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Public Affairs Officer (SECNAVINST 5720.44, NHRCINST 5720.1B)

LCDR Baker	553-8419
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Quality Life Board (NAVTRAINST 5420.4D)

Member :	HM2 Stover	553-8405
Alternate:	HM3 Howie	524-0743/4518

Record Disposal Officer (SECNAVINST 5212.5C)

LCDR Baker	553-8419
Asst: HM1 Woods	553-8423

Safety Officer (Command) (NHRCINST 5100.1B)

HM1 Malbrough	524-6728
Assistant: HM2 Ellison	553-8458

BOARDS, COMMITTEES... SECONDARY DUTIES

Safety Policy Committee (BUMEDINST 5100.6A, NMRDCINST 5100.1A, NHRCINST 5100.23)

Chairman:	LCDR Baker	553-8419
Members :	M. Aldous	3-8425
	10-M. Beckett	524-4517
	20-HM1 Almada	3-8393
	90-L. Hervig	3-8455
	50-L. Irwin	532-6199
	40-F. Jackson	3-8470
	70-LT Linnville	3-8412
	30-J. Heaney	3-8380
	60-	
Ex officio member:	LCDR Coyne	3-8457
" "	" Asst: HM2 Malbrough	524-6728

Sailor of the Quarter Committee (NHRCINST 1700.1C)

Chairman:	LCDR Baker	553-8419
Members :	LCDR Kobus	3-8417
	Command Chief PO/LPO	
Alt :	CDR Linenger	3-6896

Savings Bond Officer (SECNAVINST 5120.3G)

LT Hesslink	524-4520
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Scientific Planning and Review Council (NHRCINST 3900.2)

Chairman:	Dr. Silva	553-8421
Members :	LCDR Baker	3-8419
Deputy Sci Dirs:	Dr. Pozos	3-8396
	Dr. Nice	3-8386
Department Heads		

Security Manager (OPNAVINST 5510.1G, NHRCINST 5510.1C)

LCDR Baker	553-8419
Asst: HM1 Woods	553-8423

Security Officer (OPNAVINST 5530.14A, NHRCINST 5530.1)

LCDR Baker	553-8419
Asst: HM1 Woods	553-8423

BOARDS, COMMITTEES... SECONDARY DUTIES

Substance Abuse Screening Coordinator (OPNAVINST 5350.4A)

HM2 Lansangan

553-8384

Technology Transfer Officer (NAVMATINST 5700.2A, NHRCINST 5700.1A)

LCDR Kobus

553-8417

Voting Officer (NHRC file 1741)

HM2 Appleton

532-6165

1990 Command History-NHRC

* Reports of Major Conferences

* Senior Officer's Reviews and Updates

Encl (4)

**Formal Reports of Research findings
reported during 1990 at ***

NATIONAL, INTERNAL, AND REGIONAL MEETINGS OF SCIENTIFIC AND MEDICAL SOCIETIES

Aerospace Medical Association, 1990 Annual Scientific Meeting, New Orleans, LA,
13-17 May 90

GR Banta, "Helicopter In-flight Heat Strain and Effect of Passive Micro-
climate Cooling"

DA Kobus & GR Banta, "Operational Evaluation of Human Performance
during Sustained Operations"

American Association for the Advancement of Science, 15th Annual Meeting, New
Orleans, LA, 15-20 May 90

FC Garland, "Incidence of Human Immunodeficiency Virus Seroconversion in
U.S. Navy and Marine Corps Personnel 1986-1988 (Poster Presentation)"

American College of Sports Medicine, Salt Lake City, UT, 22-25 May 90

DA Arnall & HW Goforth, Jr., "Responses of Cold Water Divers Hyperhydrated
with Glycerol"

MB Beckett, "Wingate Power Predicted from Muscle Area and Fat-free Mass in
Women and Men" (Poster Presentation)

HW Goforth Jr, M Riedy, JA Hodgdon, E Harper & AC Vailas, "Systemic Responses
to Connective Tissue Degradation with Increased Training Intensity"

CG Gray, MD McKirnan, & PD Gollnick, "Effects of Diet and Training on Liver
and Muscle Enzymes in Miniature Swine"

JA Hodgdon, "Exercise Intensity Change, Bone Mineral and Connective Tissue
Degradation"

American College of Sports Medicine, Southwest Regional Meeting, San Diego, CA,
30 November-2 December 1990

N Sjolholm, A Sucec, M Buono, J Yeager, & C Englund, "Changes in Serum CPK
after 12 hours of Intermittent Walking are Related to Packload
Weight"

A Sucec, M Buono, N Sjolholm, J Heaney, R Bulbulian, C Leake, & C Englund,
"Changes in Serum CPK after 36 hours of Intermittent Walking with A
Load of Fifty Percent of Body Weight"

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* (by) article was presented by the person listed.

National, ...Regional Meetings of Scientific and Medical Societies cont.

American Psychological Association, Convention, 98th Annual, Boston, MA,
10-14 August 90

R Burr, "Psychological Effects of Sustained Shipboard Operations on U.S. Navy Personnel"

CE Englund, A Sucec, J Heaney, N Sjöholm, M Sinclair, Y Kawahara, R Bulbulian & C Leake, "Protective Clothing, Sleep Loss, and Diphenhydramine Effects on Performance and Physiology"

S Gomez, "Vital Signs during Sleep Deprivation: Effects of Methylphenidate and Pemoline" (Poster Presentation)

A Hoiberg & JF White, "Trends in U.S. Navy Women's Health Status and Attrition Rates"

TL Kelly, "Stimulants to Ameliorate Sleep Loss and Sustained Operations"

LL Merrill, D Kobus, & D Braun, (Invited Address) "The Effect of Sonar Experience on Distractor Potency"

DS Nice, "Sex Differences in Health Care Requirements Aboard U.S. Navy Ships"

Woodruff, SI & TL Conway, "Impact of Health and Fitness Behavior on Quality of Life"

Association of Military Surgeons of the U.S. (AMSUS), Nashville, TN,
10 November 90

DS Nice, "U.S. Navy Dental Corps Officer Survey: Perceptions, Attitudes, and Career Intent"

Association of Professional Sleep Societies, Minneapolis, MN, 27 Jun-1 Jul 90

SA Gomez - Poster Presentations:

--"The Effect of Moderate Dose of Methylphenidate and Pemoline on the Maintenance of Performance Speed during 64 Hours of Sleep Deprivation"

--"The Effect of Moderate Dose of Methylphenidate and Pemoline on Cognitive Performance Accuracy during 64 Hours of Sleep Loss"

--"Vital Signs during Sleep Deprivation: Effects of Methylphenidate and Pemoline"

TL Kelly, H Babkoff, (by) L Matteson, S Gomez, & P Naitoh, "The Effect of Moderate Doses of Methylphenidate and Pemoline on the Maintenance of Performance Speed during 64 Hours of Sleep Deprivation"

National, ...Regional Meetings of Scientific and Medical Societies cont.

H Babkoff, TL Kelly, (by) L Matteson, S Gomez, S Hauser, A Lopez, & P Naitoh,
"The Effect of Moderate Doses of Methylphenidate and Pemoline on
Cognitive Performance Accuracy during 64 Hours of Sleep Deprivation"

26th International Applied Military Psychology Symposium, Vienna, Austria,
5-12 May 90

DA Kobus, "Sustained Operations Research: New Technology"
GR Banta, "Sustained Operations Research in the U.S. Navy"

4th International Conference on Biological Rhythms and Medications of Chrono-
pharmacology and Chronotherapeutics, Nice, France, 12-15 March 90

CE Englund, "Bright Light Amelioration of Shift Work:

IV International Conference on Environmental Ergonomics, Austin, TX,
1-5 October 90

GR Banta & R Burr (by), "Heat Strain and Effect of Passive Microclimate
Cooling" (Poster Presentation)

International Epidemiological Association Annual Meeting, Los Angeles, CA,
6 August 90

FC Garland, "Melanoma in U.S. Navy Personnel and the Larger Picture"
FC Garland, "Incidence of Human Immunodeficiency Virus Seroconversion in
U.S. Navy and Marine Corps Personnel 1986-1988 (Poster Presentation)

Human Factors Meeting, Orlando, FL, 8-12 October 90

DA Kobus, S Makeig, FS Elliott & M Inlow, "Monitoring Human Performance:
An Electrophysiological Approach" (Poster Presentation)

NATO Defense Research Group, Panel VIII, Research Study Group 17, Munich, Germany
17 June 90

JA Hodgdon, "Biomedical Aspects of Military Training" and "Use of the
Logistic Equation in Models of Physical Conditioning"

Psychonomic Society, New Orleans, LA, November 90

D Williams, "Attentional and Semantic Factors in the Suffix Effect" (Poster
Presentation)

National, ...Regional Meetings of Scientific and Medical Societies cont.

Western Psychological Association Convention, Los Angeles, CA, 26-29 April 90

LL Merrill, DA Kobus & SC Sinnott, "Task Experience and Hemispheric Specialization: An ERP Analysis" (Poster Presentation)

LL Merrill, "The Integrated Area Measure of ERP's and Cognitive Workload" (Poster Presentation)

LL Merrill & T Blake, "The Draw-A-Person Test Used as a Measure of Anxiety in a Select Group of Nuclear Weapons Workers"

Woodruff, SI & JP Sheposh, "Determinants of Perceived Invulnerability"

Woodruff, SI & TL Conway, "Health-related Correlates of Perceived Life Quality"

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MILITARY SPONSORED MEETINGS

Annual Conference on Military Medicine, 5th, Uniformed Services University of the Health Sciences, Bethesda, MD, 5-6 October 90

JM Linenger, "Analysis of Community-based Comprehensive Health Promotion Programs"

Navy Occupational Health & Preventive Medicine Workshop, 32nd, Norfolk, VA, 24-29 March 90

GR Banta, DA Kobus, TP Steele, "Health and Psychological Well-being Aboard Navy Combatant Ships during Wartime Cruising in a Moderately High Heat and Humid Environment"

R Burr, "Alcohol and Drug Abuse Hospitalizations among Submarine Personnel in the U.S. Navy"

TL Conway, LK Trent, SI Woodruff, SL Kaszas, & L Luccitti, "Tobacco and Alcohol Use among Navy Personnel: 1986-1988."

FC Garland, "Cross-sectional Demographic Characteristics of Human Immuno-deficiency Virus Seropositive Navy and Marine Corps Active Duty Personnel" (Poster Presentation)

FC Garland, "T-4 Lymphocyte Counts in HIV Seropositive U.S. Navy and Marine Corps Personnel Results of the Clinical Testing Program" (Poster Presentation)

J Heaney, "The Effects of a New Combat Headgear on Physical and Cognitive Performance"

Military Sponsored Meetings cont.

Navy Occupational Health & Preventive Medicine Workshop, 32nd, cont.

A Hoiberg (Invited Presentation), "NAVCAMPRO--Status and Future"

A Hoiberg (Invited Workshop), "The Occupational Health Nurse and Case Management"

A Hoiberg, "A 12-month Evaluation of Case Management in Cost Containment and Care Coordination of Occupational Injury and Illness Cases" (Poster Presentation)

DA Kobus, "Human Factors Research in the Navy"

JM Linenger, "Worksite Health Promotion: Change in Physical Fitness Level at a West Coast Naval Air Station After One Year" (Poster Presentation)

DS Nice, "Health Care Requirements for Women Aboard Ship" (Poster Presentation)

A Sucec, J Heaney, N Sjöholm, M Sinclair, R. Bulbolian, CE Englund, & G Norman, "The Effect of the M17A2 Mask on Oxygen Kinetics during Walking or Running at Two Treadmill Speeds"

LK Trent, DS Nice & L Luccitti, "Prevalence of High Blood Pressure Among Active Duty Personnel" (Poster Presentation)

Woodruff, SI, TL Conway, & LK Trent, "Trends in Navy Physical Readiness: 1986-1988"

Naval Studies Board, Human Factors Panel "Future Carrier Technology Study", NHRC, San Diego, CA, 27-29 November 90

TL Kelly, "Work/Rest Cycle Factors related to Carrier Technology"

Navy Science and Technology Conference, NADC, Warminster, PA, 6-8 February 90

DA Kobus & SM Luria, "The Operational Use of Low Level White Lighting"

Physiologic Effects of Low Frequency Active Sonar Medical Research, Host, Naval Submarine Medical Research Laboratory, Groton, CT, 6 Jun 90

DA Kobus & GR Banta, Panel Members, "Medical Research Response to LFA/HTA Requirements"

Military Sponsored Meetings cont.

Tactical Decision Making Under Stress (TADMUS), Naval Ocean Systems Center, San Diego, CA, 24-26 October 90

D Kobus, "Stress Effects on Performance"

The Military Family Conference: Understanding the Mental Health Needs and Developing Responsive Treatment Approaches, San Diego, CA, 2 November 90

DS Nice, "The Impact of Mobilization on Navy Families"

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COLLOQUIA, MEDICAL COLLEGES, COLLEGES, AND UNIVERSITIES

San Diego State University, San Diego, CA

2-28 July: JM Linenger, "Cooperative Sports Medicine Research Areas"

May: S Linnville, (Invited Speaker) "The Application of Psychophysiological Methods to Investigating Psychopathologies"

University of California San Diego (UCSD), La Jolla, CA

Preventive Medicine Director, 5 May 90
JM Linenger, "Sports Medicine Research"

HIV Neurobehavioral Research Center, 6 September 90

6 Sep, TL Kelly, "NHRC Cross-sectional and Longitudinal Study of Sleep and Sleepiness in HIV-seropositive Patients"

July, S Linnville, "Collaboration with NHRC in conducting HIV Research"

Department of Neurosciences Seminar, October 90

S Makeig, "A New Attentional Phenomenon in the Auditory ERP"

Scripps Clinic & Research Foundation, San Diego

June, S Linnville, "Collaboration between NHRC and Scripps in the Use of the BTi biomagnetometer for HIV Research"

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OTHER CONGRESSES, CENTERS, LOCAL COMMUNITY AND/OR MEDIA

Biomagnetic Technologies, San Diego, May

S Linnville & D Kobus, "Roundtable discussion of Using the 37-channel Biomagnetometer for Studying Cognitive Performance in HIV+ Personnel"

DOD Human Factors Engineering Technical Group, San Diego, CA, 12-15 November 90

FC Garland, "Epidemiology and Disease in the U.S. Navy"

W Pugh, "Medical Information Systems"

Epidemiology of Retrovirus Infections, Workshop on the, Walter Reed Army Institute of Research, Washington, DC, 2-3 November 90

FC Garland, "Risk of HIV Infection Following Visits to Foreign Ports"

A Hoiberg (Invited Presentation), "HIV i Women and Minorities in the Navy"

Human Factors Panel, National Academy of Sciences, Naval Health Research Center, San Diego, CA, 29 November 90

W Pugh, "Findings from the Shipboard Habitability Study"

MUMPS Users Group, 19th Annual Meeting, Orlando, FL, 12 June 90

A Gino & D Ryman (by) W Pugh, "MUMPS Based Integration of Disparate Computer-Assisted Medical Diagnosis Modules"

W Pugh, Panel Leader, "Research Strategies for MUMPS-based Data"

National Academy of Sciences, Workshop on Body Composition and Military Performance, Committee on Military Nutrition, Washington, DC, 6 February 90

JA Hodgdon, (Invited Presentation) "Body Composition in the Military Services: Standards and Measurement"

National Security Industrial Associatio Conference, MPTS Approach to Systems Integration, Hampton, VA, 1-3 May 90

CAPT Chaney, "Current Naval Medical Research Efforts in Training and Safety"

Naval Ocean Systems Center, Toastmaster Open House, San Diego, CA, 15 May 90

A Hoiberg (Invited Presentation), "Total Quality Management"

Other Congresses, Centers, Local Community and/or Media cont.

Office of Civilian Personnel Management, San Diego, CA 19 July 90

A Hoiberg (Invited consultant), "Gaining Control of Occupational Injury and Illness in the U.S. Navy Civilian Work Force"

San Diego Epidemiology Research Exchange, San Diego, CA, 27 April 90

GC Garland, Chairman

The Wartime Healthcare Documentation Work Group, Fort Sam Houston, San Antonio, TX, 1-2 May 90

W Pugh, "Findings On the Evaluation of the Revised Field Medical Card"

Senior Officers' Reviews and Updates...1990

Chief, Dental Corps, RADM Clegg, and Executive Staff, Bureau of Medicine and Surgery, Washington, DC, 3 Oct 90

DS Nice, "Results of Dental Corps Survey"

Fleet AntiSubmarine Warfare School, San Diego, Feb

D Kobus, "Overview of Department Program"

German Navy Surgeon General, RADM J. Prohl (at NHRC), San Diego, CA, 7 Nov

NHRC Department Heads, "Overview of Research Programs"

J4 Casualty Study Coordination Work Group (Pentagon), Washington, DC, 13 March

W Pugh, "DNBI Study"

Navy Inspector General's Office, CAPT Hooper, Director of Health Care Review Division, Washington, DC, 5 November

C Blood, "Types of Battle Injuries Sustained aboard Warships"

Naval Special Warfare Center, CAPT Huth, Commanding Officer, NAB, Coronado, CA, 20 November

TL Kelly, "Effects of Maintenance Doses of Methylphenidate and Pemoline on Cognitive Performance during Sleep Deprivation"

Navy Surgeon General, Washington, DC

26 Apr, J Linenger, "Results of Marine Recruit Soft-tissue Injury Studies"

5 Jun, W Pugh, "DNBI Progress Study"

18 Sep, W Pugh, "DNBI Results"

Norwegian Army, Brigade North, Commander, 2nd Battalion, LtCol H. Harviken, Skibotn, Norway, 27 June

JA Hodgdon, "Findings of Joint NHRC/Norwegian Army Cold Weather Research, 1990"

OP-81 and OP-601 (Pentagon), Washington, DC, 6 June

W Pugh, "DNBI Study"

Senior Officers' Reviews and Updates...1990 cont

OP-932 (CAPT Phinney), OP-08 & Representatives of the Royal Navy Surgeon General's Office (Surgeon Commander Hayden), David Taylor Research Center, Washington, DC, 5 November

W Pugh, "DNBI and BI Studies"

C Blood, "Analyses of Battle Casualties aboard U.S. Navy Warships"

OP-45 (Pentagon), Washington, DC, 8 November

W Pugh, "Occupational Health Research"

U.S. Navy Ships

7 Jun, USS Jason (AR-8), CDR W. Stone & HMC E. Shorkey

7 Jun, USS Independence (CV 62), LT Y. Nepomuceno

7 & 15 Jun, USS Ranger (CV-61), LCDR L. Dennon, LCDR T. Colgan & LT N Simpson

26 Jun, USS Dixon (AS 37), CDR L. Morris

3 Jul, USS Acadia (AD-42), CDR R. Corbett

3 Jul, USS Cape Cod (AD-43). LT G. Montague & LTJG G. Cordova

10 Jul, COMNAVSURFPAC San Diego, CAPT Black, for two surface ships

8 Aug, COMNAVAIRPAC, CAPT Emery & USS Ranger (CV-61), LCDR Ferrara, for two carriers

A Hoiberg, "Feasibility of Conducting Healthy Back Program aboard Ship"

9 Oct, USS Paul F. Foster (DD-964), CDR Ahern

F S Elliott, "Low Level White Lighting in Surface Ships"

1990 Command History-NHRC

Major Command Awards

* Civilians

* Military

Encl (5)

MAJOR 1990 CIVILIAN HONORS AND AWARDS

Degrees/Academic
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From San Diego State University, the following civilians received degrees on 27 May: Scot Elliott (M.S./Psychology), Frances Jackson (B.A./Georgraphy), and Suzanne Kaszas Hurtado (M.S./Psychology).

**Other**  
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Mr. Martin White was awared a Community Service Award in recognition of his outstanding service for the betterment of the community, San Diego County, Combined Federal Campaign.

MAJOR 1990 MILITARY HONORS AND AWARDS

NHRC'S Sailor of the Year: HM1 Jordon Malbrough, USN
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**Sailors of the Quarter:**  
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January-March	HM2 Jordon Malbrough, USN
April -June	HM3 Elmer Labranch, USN
July -September	HM2 Davey Ellison, USN
October-December	HM3 Lester Morosi, USN

Reenlistment
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Reenlistment ceremonies were held on 17 August for HM2 Gener Camino, USN, and on 27 October for HM1 Wanda Woods, USN.

**Degrees/Academic**  
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On 14 January, HM2 Kirk Buker, USN received from National University, a Masters of Arts (Management) Degree.

Other
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April 90:

**Certificates of Special Recognition** to LCDR John T. Coyne, MSC, USN and HM2 Jordon Malbrough, USN from the Navy Environmental Health Center, Norfolk, Virginia, for the best Poster Session exhibit in the case of Research and Development, "Comparison of Rewarming Equipment for Hypothermia Casualties" at the 32nd Navy Occupational Health and Preventive Medicine Workshop held 26-29 March 90 at Virginia Beach, Virginia.

July 90:

**Personal Award Recommendation and Award Citation** to CDR Larry M. Dean, MSC, USN, from Naval Medical Research and Development Command, Bethesda, Maryland.

October 90:

Under the **Military Cash Award Program (MILCAP)**, HM2 Gener Canimo, USN was awarded \$125 for a beneficial, cost saving suggestion which was adopted by the command.

December 90:

**Meritorious Unit Commendation Citation** to CDR Jerry M. Linenger, MC, USN, while serving at the Navy Environmental and Preventive Medicine Unit No. 5, San Diego, California.

1990 Command History-NHRC

Logistic Support

Booklets used for Military Orientation

- welcome to  
SD  
1990

Encl (6)

### Logistic Support

The Center, a shore (field ) activity is a tenant command of Naval Ocean Systems Center (NOSC) in an active operating status under a Commanding Officer, and under the command and support of the Chief, Bureau of Medicine and Surgery exercised through the Commanding Officer, Naval Medical Research and Development Command. The Center is under the area coordination authority of CINCPACFLT and regional coordination of the Commander, Naval Base, San Diego, California.

The booklets from the U.S. Naval Training Center and Naval Station are used for military orientation as no facilities are available other than office spaces. The logistic support is as follows:

- a. NOSC provides direct logistic support to NHRC for functions of supply procurement, public works coordination for exterior areas, plant security and fire protection, civilian food service, safety program, and routine preventive maintenance for plant facilities.
- b. Navy Publications and Printing Service Branch Office, Point Loma, provides printing services on a reimbursable basis.
- c. Naval Hospital, San Diego; NOSC Dispensary of the Occupational Health Branch; or Naval Training Center Branch Clinic of Naval Hospital, San Diego, provide medical treatment.
- d. Naval Dental Clinic of the Naval Submarine Base provides dental treatment.
- e. Naval Training Center provides a facility for conducting research in applied physiology, as well as special services and military berthing.
- f. Naval Submarine Base provides enlisted berthing and military food service.
- g. Naval Supply Center, Charleston, South Carolina, provides civilian payroll services and authorization accounting activity services.
- h. Civilian Management Department, Naval Hospital, San Diego, provides and administers civilian personnel functions and EEO programs.
- i. Personnel Support Activity Detachment, Point Loma, provides disbursing, travel, and military personnel procedures.
- j. Public Works Center provides maintenance and public works functions, transportation, and building custodial services on a reimbursable basis.
- k. Naval Legal Service Office, San Diego, provides command legal assistance.
- l. Biomedical Communication Center of the HSETC/Naval School of Health Sciences provides audiovisual support.